

ADMINISTRATION REPORT

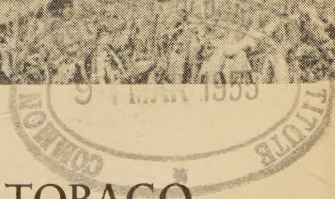
WITH THE COMPLIMENTS
OF THE DIRECTOR
OF THE DEPARTMENT OF AGRICULTURE
TRINIDAD & TOBAGO

DIRECTOR OF AGRICULTURE

FOR THE YEAR 1953



COLONY OF TRINIDAD AND TOBAGO



COVER ILLUSTRATION : Louis D'Or Demonstration Station—Tobago.

ADMINISTRATION REPORT
OF THE
DIRECTOR OF AGRICULTURE
TRINIDAD AND TOBAGO
FOR THE YEAR 1953

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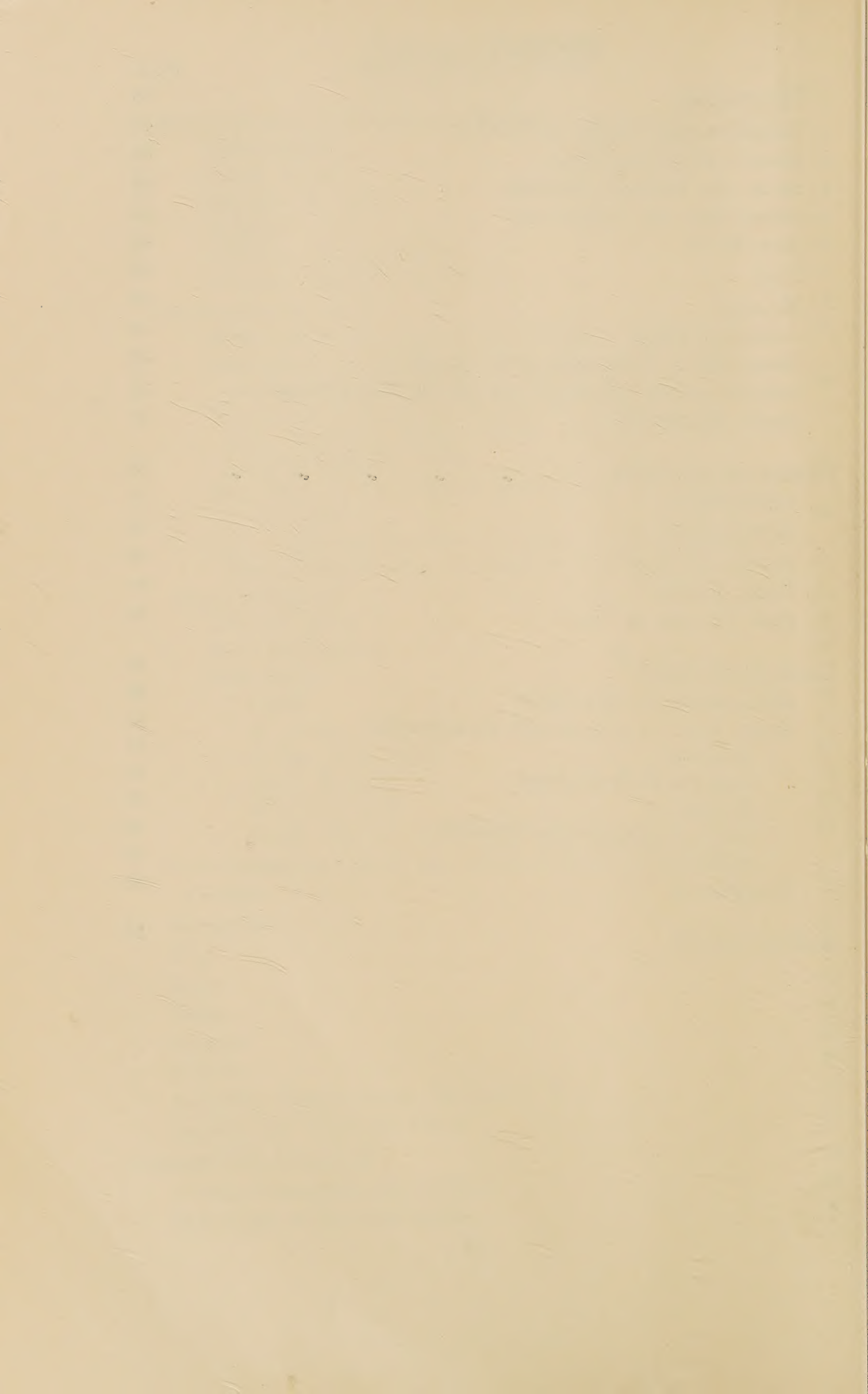
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DEPARTMENT OF AGRICULTURE, TRINIDAD AND TOBAGO
SCIENTIFIC AND TECHNICAL STAFF

(As at 31st March, 1954)

<i>Director of Agriculture</i>	...	...C. HOLMAN B. WILLIAMS, M.A., A.I.C.T.A., D.I.C.T.A.
<i>Deputy Director (Animal Husbandry)</i>	...	...L. R. HUTSON, B.V.Sc., D.V.Sc.
<i>Deputy Director (Research)</i>	...	...B. G. MONTSERIN, Ph.D., M.Sc., B.S.A.
<i>Deputy Director (Crop Husbandry)</i>	...	...E. S. CAPSTICK, B.A., A.I.C.T.A.
<i>Plant Pathologist</i>	...	...VACANT
<i>Agronomists</i>	...	...D. M. HANSCHALL, B.Sc., A.I.C.T.A. L. L. DE VERTEUIL, D.I.C.T.A., F.R.H.S. E. A. TAI, M.Sc., D.I.C.T.A.
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<i>Entomologist</i>	...	...VACANT
<i>Soil Chemist</i>	...	...G. C. WITT, B.Sc., A.R.C.S.
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<i>Senior Agricultural Officer</i>	...	...VACANT
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<i>Irrigation Officers</i>	...	...2 VACANT
<i>Soil Survey Officers</i>	...	...C. B. BROWN, B.Sc. V. I. MULLOON, D.I.C.T.A.
<i>Veterinary Officers</i>	...	...HOLMAN E. WILLIAMS, D.V.M., M.Sc. F. O. GONZALEZ, M.R.C.V.S., B.Sc., D.I.C.T.A. H. N. METIVIER, B.A., M.R.C.V.S. W. P. UNSWORTH, M.R.C.V.S. H. V. M. METIVIER, O.B.E., I.S.O., M.R.C.V.S., B.Sc. (Special duties) S. V. BLIZZARD, M.R.C.V.S.

*Superintendent, Public Gardens,
Grounds and Pastures ...*
Manager, St. Augustine Station
Senior Agricultural Assistants

...I. HOSEIN, B.Sc., D.I.C.T.A.
...VACANT
...D. M. FARRELL
A. E. JOSEPH
R. MOOSAI-MAHARAJ, D.I.C.T.A.
V. C. R. HENRY, D.I.C.T.A.
T. O. PHILLIPS
P. J. DOMINIQUE, M.B.E.
F. RAPHAEL
R. E. GREAVES, Dip. Agric.
W. O. BISHOP, D.I.C.T.A.
3 VACANT

Agricultural Assistants ...

...H. H. BEACH, D.I.C.T.A.
C. A. FORD (Apiaries)
I. E. TELFER, D.I.C.T.A.
W. A. McMILLAN
S. BHARATH
G. KHAN, Dip. Agric.
S. REDMAN, D.I.C.T.A.
E. L. ITON
M. A. LA CHAPELLE, B.Sc.
G. F. BALLY
S. G. ACHONG
P C. SCANTLEBURY
E. M. JONES
F. D. DAVIES (on contract)
5 VACANT

Manager, Tobago Farm ...

...A. N. XAVIER

Stock Inspectors ...

...D. MACFARLANE
L. PREUDHOMME
H. MOHAMMED
G. HARNANANSINGH
R. ALI
A. GEORGE
P. E. LEZAMA

Fisheries Officer ...

...W. A. KING-WEBSTER, B.A.

<i>Fish Culturist</i> ...	...	...J. S. KENNY
<i>Fishery Assistants</i> ...	...	...F. O. ASSAM
		2 VACANT
In addition there are:	...	...22 FIELD ASSISTANTS, GRADE I
		71 FIELD ASSISTANTS, GRADE II
		3 SCIENTIFIC ASSISTANTS
		1 LABORATORY ASSISTANT
		2 JUNIOR SCIENTIFIC ASSISTANTS

COCOA BOARD

<i>Chief Rehabilitation Officer</i> ...	...	...E. R. MOLL, B.SC., D.T.A.
<i>Rehabilitation Officer</i> ...	...	...A. E. PUGH
<i>Officer-in-Charge, La Pastora Propagating Station</i> ...	...	...P. C. SCANTLEBURY
<i>Officer-in-Charge, King's Bay Propagating Station</i> ...	...	...E. A. BLACK
<i>Officer-in-Charge, Marper Propagating Station</i> ...	...	...C. A. PHILLIPS
<i>Officer-in-Charge, La Reunion Estate</i> ...	...	...N. M. JARRETTE, D.I.C.T.A.
<i>Senior Cacao Subsidy Inspectors</i> ...	...	...E. A. BRUNTON
		J. H. DEANE
		F. LEZAMA
<i>Experimental Officer</i> ...	...	...C. A. SAMAROO
<i>Supervisor of Estate Propagators</i> ...	...	...F. TURPIN
In addition there are:	...	...14 FIELD ASSISTANTS, GRADE I
		9 FIELD ASSISTANTS, GRADE II

MARKETING BOARD

<i>Assistant Marketing Officers</i> ...	...	...J. C. FARRELL
		F. A. RAWLINS
<i>Senior Marketing Assistants</i> ...	...	...W. A. FLOOK
		F. A. BAIN
<i>Marketing Assistants</i> ...	...	...J. FERNANDES
		J. GONSALVES
		C. HUTCHINSON
		A. U. MASSIAH
In addition there are:	...	... 6 DEPOT ASSISTANTS, GRADE I
		13 DEPOT ASSISTANTS, GRADE II

INTRODUCTION

RAINFALL during the year was frequently heavy and rather unevenly distributed. The dry season was of short duration and there was no marked *petite carême*; consequently, conditions were not ideal for the production of market garden and other foodcrops, particularly corn and peas. Unusually high winds caused some damage to tree crops. Heavy rains and flooding occurred towards the end of the year, thereby affecting the otherwise very favourable 1953-54 cacao crop prospects.

There was little change from 1952 in the labour situation and, on the whole, supplies were adequate, except for short periods during the rice-planting season. Local shortages occurred in the Mayaro-Guayaguayare area due to increased development there in the oil industry. There was, again, minor unrest in the Cedros area which affected coconut estates to some extent.

During 1953, local markets were generally well supplied with ground provisions and vegetables. The total imports (3,582 tons) again increased in comparison with 1951 (1,322 tons) and 1952 (2,735 tons). With the exception of sweet potatoes (2,425 tons in 1953), however, imports of other commodities fell off.

The rice crop was a good one and the low prices for paddy, sustained up to the end of the first quarter of 1954, may be considered a reflection of this, although it is considered that the somewhat defective marketing organisation and a suspected prejudice against local rice have had some influence on the situation.

The year 1953, however, must go on record as one in which the value of agricultural exports, raw and manufactured, increased by some \$10,876,410 (30 per cent.) on the 1952 figures (\$36,459,058) to a total of some \$47,335,468.

The year saw the ratification of the Negotiated Price Quota under the Commonwealth Sugar Agreement, with the price fixed at a peak of £42. 6s. 8d. per ton for two-thirds of the island's production, the price fixed by the same formula for 1954 being £41 per ton. With an increase in production of some 15,000 tons, sugar and its by-products, raw and manufactured, were responsible for the greatest individual increase (\$6,000,000).

Increases in the quantity and value of cacao and citrus products exported were substantial although the uncertainty of a market for the expanding citrus industry remains an ever-present cause for concern.

The only appreciable decrease, in comparison with the figures for 1952, was in respect of coconuts and their derivatives. It should be remembered, however, that the 1952 crop was a bumper one and the 1953 crop was still, by past standards, a fair one.

The favourable prices for copra and copra products were maintained. However, the problem exercising the minds of all concerned is the maintenance of a stable price for copra should the world prices fall any lower than the current one, since the industry is without the safeguard of any long-term agreement. In addition, the increased incidence of Red Ring disease is becoming a serious threat to this industry.

The steady expansion of the coffee industry, due to sustained high prices, viewed in the light of a more diversified agricultural economy, is a cause for satisfaction.

AGRICULTURAL POLICY

The recommendations of the Agricultural Policy Committee continued to be followed and during the year the energies of the Department were particularly directed towards the active implementation of the recommendations contained in the Interim Report of the Local Food Production Committee (Council Paper No. 46 of 1951).

2. The Local Food Production Committee held further meetings towards the end of 1952 and their second Interim Report (Council Paper No. 16 of 1953) was approved by the Legislative Council in 1953.

3. As in previous reports, the recommendations of this Committee are reproduced below and brief notes are included which indicate the action which has been taken. Reference to subsequent sections of this Report will provide information in greater detail.

GENERAL

(1) *Optimum use of the land for the purpose to which it is best suited, to be the basic condition of the measures to be pursued.*

(2) *Increase in local food production to be undertaken as an integral part of a long-term project aimed at placing all phases of local agriculture at the highest sustained potential, while ensuring that, in case of a shipping crisis, adequate food would be available.*

(3) *The agricultural education of the rural population to be a major function of the Extension Division of the Department of Agriculture.*

(4) *Complete self-sufficiency in all respects not being a sound objective, either economically or sociologically, and the increase of exports being essential for maintaining the rising standard of living of the growing population, a proper balance to be maintained between production for local consumption and production for export.*

(5) *The scope of the Agricultural Credit Bank to be widened to enable loans to be issued for fisheries development and for the manufacture or processing of agricultural or fishery products.*

LEGISLATION AND ITS ENFORCEMENT

(6) *Controls on the prices of locally-grown foods, of vegetable, animal and fish origin, to be removed; in the case of vegetable products, adequate notice to be given so that growers may produce in anticipation of the date.*

Action was continued as in 1952.

(7) *More rigid permanent legislation on Praedial Larceny to be enacted.*

The necessary legislation now falls under two Ordinances:—

(a) The Summary Offences Ordinance; and

(b) The Sale of Produce Ordinance.

Legislation under (a) has been enacted; that under (b) awaits enactment.

(8) *Copra to be added to the list of "licensable produce" in the Sale of Produce Ordinance, Ch. 23. No. 18, and the provisions of the Ordinance, especially in respect of dealing in licensable produce only at licensed premises, to be strictly enforced.*

Draft legislation has now been prepared and is being considered by the Legal Department.

(9) *The amendment of Income Tax legislation and/or its application to provide remission of tax for expenditure incurred in the establishment or rehabilitation of new crops and in the repair or construction of buildings for agricultural purposes.*

The report of the special committee appointed in 1952 to review and report on this recommendation has been favourably considered by Executive Council and steps are being taken to have the necessary legislation drafted.

(10) *The slaughter of heifers and cows, under 10 years of age and not condemned by a Government Veterinary Officer, to be prohibited and the prohibition strictly enforced.*

Implementation as in 1952.

(11) *A much wider range of responsible persons to be empowered to issue permits for setting fire and their names and addresses to be fully publicised.*

Implementation as in 1952.

(12) *A much wider range of responsible persons to be appointed Members of Fire Vigilance Committees and Officers of the Agricultural Department to be included in the list in section 18 (1) of Ordinance No. 11 of 1942.*

Implementation as in 1952.

(13) *Legislation to be enacted which will provide for a wider range of bodies to be registered than that permitted under the existing Co-operative Ordinance which only provides for Agricultural Societies (fishermen's co-operatives, for example, being excluded under the present law).*

Implementation as in 1952.

(14) *Measures to be taken to enforce the existing legislation in regard to the sizes of mesh used in fish nets and seines.*

Action on this recommendation has been suspended in the absence of statistics showing the need for it.

(15) *The existing legislation on the rental of agricultural land which, as now worded and interpreted, discourages private proprietors from renting lands, to be reviewed and amended so that unused land may be more readily rented for short periods.*

Implementation as in 1952.

(16) *Authority to be conferred upon the appropriate officer of Government empowering him to limit the importation of "white" or "Irish" potatoes at periods of maximum production of local starchy foods.*

This recommendation will be implemented as soon as the volume of locally produced food expands to a sufficiently high level.

The control measures which it will be necessary to introduce have already been devised by the Department of Industry and Commerce.

(17) *Limitation of the movement of animals to and from Tobago, except insofar as may, at times, be required as a quarantine measure, to be entirely removed. (Tobago should be regarded as an integral part of the Colony analogous to Cedros and no more remote).*

Implementation as in 1952.

(18) *The rebate of the tax on gasolene, which is now restricted to the operation of tillage, to be extended to those of weeding, underbrushing, harvesting (including forage harvesting), binding and threshing, but not haulage, and to the fuel used by the engines of commercial fishing craft.*

This recommendation is still receiving consideration by Government.

(19) *The policy in regard to Crown lands should be one of orderly and progressive development based on the following general principles :—*

- (i) *Lands to be used for the purpose to which they are best suited;*
- (ii) *Lands to be leased and not sold;*
- (iii) *Leases to be of a probationary type at first, to be followed, if the tenant prove satisfactory, by a long-term renewable lease;*

- (iv) *All leases to embody an approved and agreed-on programme of work and development; the execution of which will be a condition of continued tenancy;*
- (v) *The rate of alienation to be strictly co-ordinated with the Staff available for inspection, both initial and periodic, recording, mapping, &c.;*
- (vi) *Shifting cultivation to be avoided and emphasis placed on permanent long-term residential occupation;*
- (vii) *Size of holding to be such that, as a minimum, wholetime occupation be provided for the lessee.*

Implementation, by the District Services Division, of the policy referred to in the 1952 Report continues and the progress made is indicated in Table I.

(20) *Where land is available in the vicinity of towns or large villages, a limited number of allotments to be made available for employed workers who wish to grow their own food.*

Implementation as in 1952.

(21) *Private interest to be encouraged to bring the maximum acreage into cultivation by action under the following recommendations:*

<i>Acceleration of Cacao Rehabilitation</i>	— See (4).
<i>Income Tax Concessions</i>	— See (9).
<i>Removal of Price Controls</i>	— See (6).
<i>Control of Praedial Larceny, and Amendments to the Control of the Rents of Small Agricultural Holdings Ordinance</i>	— See (7). — See (15).

(22) *The Land Settlement plan for the next five years to be pursued, care being taken to equate land settlement projects to the Agricultural Staff available for supervision, it being beyond the slightest doubt that such projects can only succeed where strict enforcement of the best agricultural practices prevails.*

Implementation of this recommendation continues and the progress made is outlined in a later section of this Report under the heading Land Settlement.

(23) *The wage-earning public, as distinct from professional farmers, to be encouraged by propaganda and advice to utilise their backyards and gardens for growing some portion of their food, vegetable or animal.*

Implementation as in 1952.

(24) *Government Departments and Private Occupiers to be encouraged to plant trees which produce some sort of food (breadfruit, mango, coconut, &c.) on all idle land and when, for purposes of controlling soil erosion, or for windbreaks, shade, &c., it is desirable to plant a tree or trees.*

Implementation as in 1952.

(25) *Government to accelerate the provision of additional rice lands and the amelioration of drainage and irrigation on existing rice areas, as may be recommended by the Standing Rice Committee.*

The work on the four major Rice Expansion Schemes continued throughout the year and it is hoped that the basic engineering works at Plum Mitan, Fishing Pond and Caroni Savannah will be completed before the end of 1954.

On the Central Experiment Station, most of the 125-acre irrigated block was planted with pure line paddy and a layout of the whole of this area will be completed early in 1954.

UNITED STATES BASES

(26) These areas remained under the control of Government.

Waller Field :

During the year, no additional garden allotments to the 120 occupied during 1952 were taken up. 246 acres of a total of 486 acres of standing permanent crops were rented out in holdings of varying size.

North Manzanilla :

It was reported erroneously, in 1952, that 300 holdings, varying in size from 4 to 7 acres, had been laid out. There are, in fact, only 120 holdings and 70 were allocated in 1953.

Carlsen Field :

Of the 900 acres leased to Woodford Lodge Estate, an appreciable amount has been rented to canefarmers and observation plots of various grasses and cover crops have been laid down. Regularisation of the tenancies of squatters is being carried out by the Warden.

ANIMAL HUSBANDRY

(27) *Government to invest \$450,000 in the purchase and erection of a building and plant for converting citrus waste into a stockfeed ingredient.*

The machinery was installed and the plant will begin operation in 1954.

(28) *The Department of Agriculture to suspend the sale of female stock (more especially cows) for one or two years so as to increase its herds permanently, thus ensuring a marked increase in the numbers offered for sale, annually, thereafter.*

Implementation as in 1952.

(29) *The Department of Agriculture to purchase 25 buffalo heifers, locally, and from abroad, 200 cows, 100 sows, 100 ewes, 100 does and 300 hens, for the production of increased numbers of progeny for sale to the public.*

Implementation of this recommendation continues. Total purchases of imported breeding stock during 1952 and 1953 have been as follows :—

Cattle	...	...	...	136
Does	...	...	...	45
Ewes	...	...	...	75
Sows	...	...	...	77
Day-old chickens (White Leghorn and R.I.R.)			...	320

In addition, 14 water buffalo heifers have been purchased locally.

(30) *The Department of Agriculture to add three Junior Livestock Inspectors to its Staff and to take measures to enforce strictly the regulations prohibiting the slaughter of fertile cows.*

Implementation as in 1952.

(31) *The Department of Agriculture to be allocated a revolving fund of \$10,000 to be used :—*

- (i) *for the purchase of fertile cows whose sale for slaughter has been stopped;*
- (ii) *for the importation of breeding stock for stockmen who place firm orders.*

(i) This recommendation has been implemented.

(ii) This recommendation has not yet been implemented.

Funds have been made available but no demands has been received.

(32) *Operators of large estates to be invited to grow, as a minimum, the feed needed for their own herds.*

Implementation as in 1952.

(33) *The Marketing Board (a) to increase the number of points at which it sells stockfeeds and its publicity in regard to same; (b) to purchase molasses at the rate agreed on for local distilleries (thus ensuring an unlimited supply) and to sell same in its various depots.*

Implementation as in 1952.

(34) *The Department of Agriculture, or private interests under its control, to test the feasibility of establishing pastures on the less fertile soil types of the former American Bases (when Government shall have received recontrol of same) and to make recommendations on the results of the experiment.*

This recommendation is being implemented. Observation trials are being carried out on Carlsen Field and, for convenience, on land adjoining the O'Meara Breeding Unit. This Station is close to the Waller Field area and contains land of the same soil types.

(35) *The Department of Agriculture to be provided with an additional Veterinarian.*

This recommendation has been implemented.

(36) *Veterinarians of the Department of Agriculture to undertake private work, on a fixed scale of fees, on farm animals (domestic pets excluded) located more than 20 miles from the home of an active private Veterinarian, and to pay the fees earned into Revenue.*

This recommendation has been implemented.

(37) *Government Veterinarians, undertaking private practice, to be paid a fixed non-pensionable allowance and provided with a revolving fund of \$500 for drugs.*

This recommendation has been implemented.

(38) *The Department of Agriculture to establish six additional breeding units in 1952, and to be allowed to let out their construction on contract.*

The breeding units at Balmain (Couva), Princes Town, Charlotteville (Tobago) and Northside (between Parlatuvier and Bloody Bay, Tobago) are now in operation. The unit at Coryal (St. Andrew) has yet to be completed and the sixth unit at Tournebride Estate, Mayaro, will be constructed during 1954.

(39) *If two milk processing plants are to be established in the Colony, consideration to be given to one of them being set up in Tobago.*

No action so far has been taken on this recommendation.

(40) *Funds to be provided for the expansion and modernisation, in stages, of the stockfeed mixing plant at St. Joseph.*

This recommendation is being implemented.

CROP HUSBANDRY

(41) *The Cocoa Board to be invited to accelerate rehabilitation by :*

- (i) *Erecting more propagating units (with a capacity of 5,000 plants upwards) on private lands;*

In addition to the four (10,000-plant) Estate Propagators constructed in 1952, two (10,000-plant and 18,000-plant) were constructed in 1953. The total capacity of two Estate Propagators was further increased from 20,000 to 42,500 plants while the extension of a third will be completed in 1954.

- (ii) *Increasing the percentage of the total area eligible for rehabilitation grants beyond the 10 per cent. now allowed.*
Implementation as in 1952.
- (iii) *Substantially increasing the amount of 10 cents per plant at present allowed per tree planted in areas in excess of those eligible for a full rehabilitation grant.*
Implementation as in 1952.
- (iv) *Importing banana plants for sale to peasant growers.*

The Board agreed, in 1952, to import a limited number of Lacatan Bauana plants from Dominica for the establishment of nurseries on Government stations and for free distribution to clonal cacao planters. In 1952, 10,051 plants were imported and in 1953, 14,841. It is expected that further quantities will be imported in 1954.

(42) *The Department of Agriculture to increase its area under local foodcrops, at the Central Experiment Station and the Demonstration Stations, by 70 acres for the provision of planting material for sale.*

In broad terms, the Department achieved the target set in 1952 when the demands for seed and planting material were met. It is clearly impracticable, however, to continue treating 70 acres as a separate entity. The present policy of the Department is to relate the acreages of foodcrops, grown in rotational cropping programmes on the Department's stations, with the Marketing Board's demand for seed and planting material, as well as the real demand in the various districts.

(43) *The Marketing Board to increase and expand its depots and activities as well as its propaganda in regard to :*

- (i) *The sale of seeds, planting material, fertilizers, insecticides and cartridges;*
- (ii) *The purchase of food in areas of high production and its resale in areas of low production.*
Implementation as in 1952.

(44) *The Marketing Board intensively to publicise its guaranteed minimum prices for locally-grown foods, revising the figures annually and keeping them as high as market conditions may permit, and to offer short-term maximum guarantees when conditions warrant.*

Action was again taken, as indicated, and the prices fixed during the year were as shown in Table II.

(45) *The Department of Agriculture to consider, in the light of results obtained from a drive now in progress in Tobago, the advisability of purchasing a stock of guns and organising drives against vermin and crop-destroying birds in specific areas and at specific times.*

Further implementation of this recommendation is still under review.

(46) *The Forestry Department to increase the area of Government teak plantations by 200 acres a year with a view to a permanent addition (2,000 acres in 10 years) to the country's capital assets and an increase in annual food production, the new lands to be split up between two to three zones.*

This recommendation is being implemented.

FISHERIES

(47) *Proposed legislation for organising, assisting and controlling the Fishing Industry to be enacted, but provision for loans to be excluded therefrom (loans, as distinct from grants, should be dealt with through the lending agency of the Agricultural Credit Bank).*

This recommendation is being examined by the Fisheries Advisory Committee.

(48) *Additional depots and refrigerated trucks to be equipped by the Marketing Board for its important function of distributing and marketing fish.*

The plans and estimates for establishing a cold storage plant for fish in Port-of-Spain are still being studied.

(49) *The appointment of a fully-qualified Fishery Officer, and his equipment with the means of studying the various aspects of the industry and improving the techniques of fishermen, to be accelerated.*

This recommendation has been implemented.

(50) *The organizations investigating the possibility of introducing Modern techniques to the local fishing industry to be given every possible facility.*

Implementation as in 1952.

LOANS ADMINISTERED THROUGH THE AGRICULTURAL CREDIT BANK

(51) *The sum of \$2,115,000 to be provided for augmenting the lending activities of the Bank.*

Implementation as in 1952.

4. During 1952, the Local Food Production Committee held two further meetings and submitted a second Interim Report which was published as Council Paper No. 16 of 1953. A summary of their recommendations and action so far taken is as follows :

LEGISLATION

(1) *The Draft Ordinance to amend the summary Offences Ordinance should be passed into law. Fines should range from a minimum of \$25 to a maximum of \$500 and imprisonment from a minimum of one month to a maximum of six months. The attention of Magistrates to be drawn to the need for awarding costs to witnesses, &c., commensurate with the time lost and expense involved.*

See (7) on page 3. The proposal outlined in the last sentence of this recommendation was not approved.

(2) *The Draft Ordinance to amend the Sale of Produce Ordinance should be passed into law. A shrinkage of 1% on copra should be allowed.*

This Ordinance awaits enactment. The proposal regarding copra shrinkage has not been accepted.

(3) *Remission of the tax on gasoline for fishing boats, along the lines approved by the Fisheries Committee, to be allowed.*

See (18) on page 4.

LAND UTILISATION AND SOIL CONSERVATION

(4) *No pains should be spared to secure a visit and advice from Dr. H. H. Bennett. Following his report, every effort should be made to implement his recommendations and to provide a service for advising and assisting farmers who wish to draw up land-use programmes and to undertake soil conservation measures.*

Despite exhaustive efforts, it has not yet been possible to finalise arrangements for a visit by Dr. Bennett.

(5) *The Department of Agriculture to be provided with the funds required for testing out grasses and techniques on mountain slopes which might be too steep or the soil too poor to support permanent or arable crops, but which might be suitable for grazing areas. The possibility of mountain streams being used for irrigation to be tested.*

Shortage of staff has precluded any action being taken on this recommendation so far.

(6) *Early institution of a scheme for fire-watching and fire-control for rural areas to be started. The co-operation of the Light Aeroplane Club to be sought in this respect. The law obliging persons to help in controlling fires to be enforced.*

This recommendation is still under review.

(7) *The attention of the Department of Works and Hydraulics to be drawn to the need for greater care to be taken in leading water off roads and into private lands, and to be requested to see that its Culverts are laid with due regard to the removal of drainage water from neighbouring land.*

Action was taken as indicated.

AGRICULTURAL ENGINEERING RESEARCH AND ADVICE

(8) *An Agricultural Engineer to be appointed to the Staff of the Department of Agriculture without delay, this post to take the place of that of an Agricultural Economist, if necessary.*

It was not possible to obtain the services of an Agricultural Engineer during 1953 but the post appears on the 1954 Estimates.

PRACTICAL COURSES IN FARMING TECHNIQUES

(9) *Agricultural Courses of short duration to be offered at one centre in Trinidad and one in Tobago. These courses to provide sound practical and some theoretical training to practising agriculturists and those desirous of following the rural way of life. Two hostels to be erected, one at St. Joseph Stock Farm and one at Louis d'Or, Tobago, accommodating 16 and 8 persons, respectively. A responsible officer, of the level of a Senior Agricultural Assistant, to be placed in charge of the courses. Students to supply their own towels and bed-linen and provide their own meals. An allowance of \$1.50 per day to be paid to those students whose circumstances may not permit them to pay their own way entirely.*

Shortage of staff precluded action being taken on this recommendation in 1953 but it is hoped that the hostels will be completed in 1954.

PROCESSING MILK IN TOBAGO

(10) *A small milk-processing plant to be installed and operated at the Tobago Farm for the manufacture of cream, butter, ghee, &c., from milk in excess of the fluid-milk requirements. Milk for processing to be purchased at 55 cents per gallon delivered at the Farm.*

A pasteurizing plant is in operation at the Tobago Farm but the full implementation of this proposal awaits the arrival of an officer who is receiving training in the United Kingdom.

AUDEO-VISUAL AIDS IN AGRICULTURAL EDUCATION

(11) *Measures should be taken to accelerate and expand the production of locally prepared films, film-strips, &c., for use in educating farmers in improved techniques.*

With the probable establishment of an Adult Education Training Centre Workshop before the end of 1954, it is hoped that steps can be taken to implement this recommendation.

AGRICULTURE IN THE COLONY

GENERAL CONDITIONS

5. The annual rainfall for a number of selected stations throughout the Colony and the monthly means for 1953, as well as for a 22-year average, are given in Tables III and IV. These data have been kindly supplied by the Hydrologist of the Works and Hydraulics Department.

6. There were further increases in wages in all the agricultural industries by private enterprise as well as Government. At the beginning of the 1953 crop, the wages of all day, time and task workers in the sugar industry were increased by a further 18 per cent. on the 1949 basic rates. This was equivalent to an increase of $12\frac{1}{2}$ per cent. on the rates prevailing in 1952. The increases granted on the 1949 rates now total 62 per cent., i.e., $12\frac{1}{2}$ per cent. in 1950, $12\frac{1}{2}$ per cent. in 1951, 19 per cent. in 1952 and 18 per cent. in 1953.

AGRICULTURAL PRODUCTS FOR HOME CONSUMPTION

Crops

7. Weather conditions were not generally favourable for the production of foodcrops. Rainfall during the year was heavy and unevenly distributed and there was no marked *petite carême*.

8. Following the good crops of maize harvested and planted in 1952, production was maintained in 1953 until the close of the dry season. Planting during the year was done on a large scale but, due to the weather, yields were poor, except in Tobago. The lack of a *petite carême* limited later planting and this has adversely affected 1954 supplies.

9. As a result of extensive planting in 1952, pigeon peas were in good supply. Adverse weather conditions, however, led to reduced planting in 1953. Production of pulse-crops from the lagoon areas was good. The quality of both these and pigeon peas, however, was poor.

10. Some extension in the planting of ground provisions, in particular sweet potatoes, tannias, dasheen and yams, was noted, probably the result of the decontrol of selling prices.

11. During the earlier part of the year, the growing of green vegetables was seriously hampered by excessive rain. As a result, supplies were short and prices at times exorbitant. As weather conditions improved, there was a marked increase in planting, particularly in the market-garden areas of St. George. It is felt that some stimulus to production was provided by the Garden Competitions organised by the field staff.

12. Vegetable supplies in Tobago were limited and had to be met, to a large extent, by Trinidad producers. With the growing tourist industry in that island, there is a need for expansion in market gardening.

13. Adequate supplies of bananas were available throughout the year but there was, almost always, a shortage of plantains, except for the local requirements of Tobago. The extension of the Marketing Board's purchases to Mayaro and Guayaguayare stimulated production in those areas.

14. The rice crop was a good one, though heavy rain and high winds caused some lodging. Losses were not appreciable, however, and the harvest was only delayed to a limited extent by the heavy rains at the end of the year.

15. Encouraging reports have been received regarding the pure line paddy distributed by the Department and peasants have claimed yields of 2,400 lb.-3,400 lb. per acre from D. 110 and Sughandi.

16. Satisfactory yields were obtained from the hill rice crop which is mainly confined to the areas cleared by the Forest Department for teak planting.

Livestock

17. *Supply of Stock Feeds*—There were adequate supplies of corn available throughout the year, provided by a carry-over of the record crop during 1952, in addition to that reaped during 1953, although a much smaller harvest. The supply of rice husks which provides rice bran and broken rice was greater than in the previous year. The supply of cottonseed meal was limited. Coconut meal was readily obtainable and requirements of molasses, both for inclusion in feeds and for sale by the Marketing Board, were sufficient.

18. *Meat and Milk Production*—Figures from Municipal and Government-controlled slaughter-houses, which do not represent complete data for all livestock slaughtered in the Colony, show that 1,296 tons of beef and veal, 643 tons of pork and 58 tons of mutton were slaughtered. Similarly, complete production figures for fresh milk are not obtainable, but returns from the larger producers show that they handled 26,460 gallons per month.

19. *Importations*—The animal imports are listed in Table V.

20. The imported fresh meat supply of the Colony came chiefly from New Zealand and Australia in the form of frozen meat and is summarised in Table VI.

Apiculture

21. There were 219 registered apiaries at the close of the year with a total of 2,305 colonies. Weather conditions for honey production were less favourable than in 1952; production returns for the year were 99,659 lb. of honey and 1,951 lb. of beeswax. 47,233 lb. of honey were exported.

AGRICULTURAL EXPORTS IN 1953

22. With the exception of coconut products and some minor items, there was a substantial increase in the quantity and value of agricultural exports in 1953. The figures indicate an increase of some \$10,876,410 (30 per cent.) on the total (\$36,459,058) for 1952.

23. The quantity and value of the various agricultural exports are shown in Tables VII and VIII, the data for which were kindly supplied by the Government Statistician. The figures quoted are preliminary ones and subject to final review.

Sugar

24. Sugar production in 1952 totalled 152,618 tons. This was 15,260 tons more than for 1952 but 6,517 tons less than the production of the peak year 1949. The crop produced 15,000 tons more sugar than was expected before crop began. This was chiefly due to good weather during the grinding season and to some plant canes which were expected to be left over until 1954 ripening-off in May sufficiently to warrant reaping.

25. The final crop figures, compared with the previous year, are set out in Table IX.

26. Farmers deliveries during the year represented an increase of almost 100,000 tons over 1952 although the number of farmers actually delivering canes was 600 less than in the previous year.

27. In general there was a noticeable improvement in the way in which many canefarmers' holdings were maintained, this being largely the result of the prevailing good prices.

28. The quantity of sugar retained for local consumption was again fixed at 23,000 tons which included sugar used in the manufacture of produce for export. On 1st February, 1953, the price of all grades of local sugar was increased by 1c. per lb.

29. The rate of shipment of 1953 export sugar was not entirely satisfactory as the regular supply of vessels fell well below requirements during the important months of March, April and May. It was fortunate that the Port Services were able to permit the use of extensive additional accommodation at the newly acquired Docksite, thereby relieving what would have developed into an extremely difficult storage position. The last regular consignment of export sugar was lifted during the month of October.

30. Exports for the year totalled 129,629 tons. 1,000 tons were shipped to Canada, 144 tons to the neighbouring island of Grenada and the remainder to the United Kingdom. Shipment in bulk was further developed and altogether 61,278 tons were shipped in this manner in 1953 against 53,850 tons in 1952 and 16,000 tons in 1950 when this method of shipping was inaugurated.

31. Froghopper attacks were experienced during the latter part of the year but satisfactory control measures were taken. The use of aircraft for observation by some companies has facilitated detection of attacks in the very early stages.

32. The price of "Negotiated Price Quota" export sugar under the Commonwealth Sugar Agreement was calculated by application of the approved formula and was fixed at £42. 6s. 8d. per ton for 1953 which represented an increase of £3. 16s. 8d. over the price of the previous year. At the price review held in London in November, the Negotiated Price for 1954 was fixed at £41 per ton by the application of the formula. These prices relate to 124,578 tons of Trinidad's export sugar which is our Negotiated Price Quota under the Commonwealth Sugar Agreement. At the present time, however, the price that can be obtained for sugar outside this quota is fully £10 a ton lower.

33. Effective from the commencement of crop on each estate, the wages of all day, time and task workers in the Industry were increased by a further 18 per cent. on the 1949 basic rates, equivalent to an increase of $12\frac{1}{2}$ per cent. on the rates prevailing in 1952. The increases granted on 1949 rates now total 62 per cent., i.e., $12\frac{1}{2}$ per cent. in 1950, $12\frac{1}{2}$ per cent. in 1951, 19 per cent. in 1952 and 18 per cent. in 1953.

34. Advances from the Labour Welfare Fund to sugar workers for the improvement of housing conditions have proceeded at a high rate. At the end of the year, loans totalling \$1,045,080 had been made to 1,249 workers in the industry.

Cacao

35. Although the 1952-53 crop did not come up to expectations, the quantity (21,684,496 lb.) and value (\$11,729,114) of exports in 1953 were appreciably greater than those of 1952. The quantity of raw cacao exported is the greatest since 1945 and is approximately half of that exported in 1938.

36. The frequent spells of wet weather led to a high incidence of Witches Broom and Black Pod, and the wilting of cherelles was severe. Prospects for the 1953-54 crop were reduced by heavy rains and flooding at the end of 1953.

37. Exports and value of raw cacao for the last five years are shown in Table X.

Citrus

38. The 1952-53 crop was a good one and the quantity and value of exports of citrus products, in 1953 (\$3,227,091), were almost treble that of 1952 (\$1,347,587).

39. The Co-operative Citrus Growers' Association produced 663,581 cartons of juice and exported 183,524 cases of fresh fruit. Of the juice produced, 74,096 cartons were sold locally and 571,100 were exported.

40. Despite the increased totals, appreciable losses occurred in dropped and unpicked fruit during the first quarter of 1953. This was the result of low prices at that period and delays in purchase due to the uncertainty of the export market. Prices improved towards the end of the year but the lack of a reasonably stable market remained a constant threat to this industry.

41. In general, grapefruit and orange crops remained in healthy condition and increased planting, particularly of oranges, continued. In this respect, advantage is being taken of assistance offered by the Cocoa Subsidy Scheme and the letting of Crown lands on Probationary Agreements is, to some extent, responsible for increased interest among small holders.

42. Limes continued to decline although heavy crops were reaped in the Mayaro area. In Tobago, 2,300,000 lb. of limes were purchased by the factories, as compared with almost 3,000,000 lb. in 1952.

Other Crops

43. *Coffee*.—The crop was a good one and the prevailing high prices continued to encourage additional planting, particularly of Robusta, as well as improved maintenance of existing holdings. It is noteworthy that the Cocoa Board approved assistance under the Cocoa Subsidy Scheme for the planting of 614 acres of coffee during the year. The export value of raw and manufactured coffee products has increased from \$1,096,298 in 1951 to \$1,467,731 in 1952, to \$1,840,509 in 1953.

44. *Bananas*.—Owing to the severe drought in 1952 which affected the plantations, exports continued to decline. Whereas 50,039 stems were shipped in 1952, the shipments for 1953 totalled some 45,546 stems. By the end of the year, shipments started to improve, due to the wetter weather in the early part of the year, and new cultivations were coming into production.

45. Apart from the contract with the Caribbean Fruit Company of New Orleans, United States of America, which was renewed in 1952 for a period of five years for the export mainly of Gros Michel, it would appear that there are fair prospects of marketing other varieties provided sufficient inducement is offered to shipping agencies, and it is felt that provided production can be increased in conjunction with the clonal cacao planting programme, the Lacatan and Governor varieties are likely to provide the best prospects.

46. Considerable interest is, therefore, being shown in the development of a banana industry and a Committee of the Agricultural Society, including members of the Department, has been appointed to consider the possibilities.

47. Reference is made elsewhere in this Report to the importation of Lacatan planting material by the Cocoa Board.

48. *Rubber*.—Export values declined from \$102,819 in 1952 to \$42 910 in 1953.

49. *Tonca Beans*.—There was a notable increase in the quantity and value of tonca beans exported in 1953 (414,982 lb.—\$542,116) compared with 1952 (12,983 lb.—\$22,438).

WORK OF THE DEPARTMENT OF AGRICULTURE

50. Fluctuations in the staff available continued and, again, the Extension Services remained the division which was most affected. During most of 1953, this Division carried on with an acting Senior Agricultural Officer, one Agricultural Officer in Tobago and one acting Agricultural Officer for the whole of Trinidad, instead of the normal complement of a Senior Agricultural Officer, two Agricultural Officers in Trinidad and one in Tobago.

51. Considerable recruitment of junior field staff has been carried out but, while the shortage in numbers in these grades is now not so acute, there is a dearth of experience. Out of a total establishment of 71 Field Assistants, Grade II, the year ended with only 44 having had more than two years' experience with the Department.

52. There will be a further strain in 1954 when 17 members of the Field Assistant grade enter the Eastern Caribbean Farm Institute for the first course. This strain, however, is willingly accepted in view of the long-term benefits which will ultimately accrue.

53. It is, however, now, not so much at the Field Assistant level that the shortage of staff is being felt but at the level of the more senior grades of field officers. As this Report is being typed, the Department is short of a Senior Agricultural Officer, an Agricultural Officer, 3 Senior Agricultural Assistants and 4 Agricultural Assistants while, as a result of leave and University courses, 3 substantive Senior Agricultural Assistants are acting as Agricultural Officers.

54. This section of the Report summarises the activities and achievements of the Department of Agriculture. Fuller details, in unpublished reports of individual officers, are available and enquiries regarding any particular aspect of the work will be welcome.

55. As a result of the general staff situation, certain projects, such as special Assistance to Cane Farmers, have had to be held in abeyance.

EXTENSION

56. The Department's Extension Division offers the following services :—

- (a) General advice to the public on agriculture;
- (b) Inspection visits to school gardens for advice and judging in connection with the Annual Competition;
- (c) Supervision of over 10,000 acres of food gardens;
- (d) Inspection of Crown lands and interviews with applicants requesting leases for agricultural purposes;
- (e) Assistance and support to agricultural organizations, agricultural exhibitions and livestock shows;
- (f) Supervision for the district breeding units;
- (g) Supervision and management of district demonstration stations;
- (h) Parasol ant nests destruction on Crown lands;
- (i) Plant Protection Service.

57. In addition, it collects data for Crop Surveys and any information from the districts required by the Agricultural Department.

58. District demonstration stations are maintained at Sangre Grande, Rio Claro and Penal, and at Louis d'Or in Tobago. The objects of these stations are :—

- (a) to ascertain a suitable system of mixed farming for application to peasant agriculture;
- (b) to demonstrate methods of crop production and livestock management which the peasant can copy;
- (c) to be a centre for the distribution of seed, planting material and stock;
- (d) to be the local headquarters of the Agricultural Department.

59. Disposal of livestock and crops, mainly from demonstration stations in the District Services Division at El Reposo (Sangre Grande), Rio Claro, Penal and Louis d'Or, Tobago, for breeding or planting purposes and for consumption, is shown in Table XI.

60. Revenue derived at the District Stations from the sale of livestock and crop products is represented in Table XII.

61. The Extension Division now maintains 24 district breeding units and statistics regarding their activities are as follows :—

<i>Animals</i>				<i>Services</i>	
Jacks	...	...	...	...	168
Bulls	...	...	...	...	1,859
Boars	...	...	...	...	490
Bucks	...	...	...	...	1,151
Rams	...	...	...	...	57

CENTRAL EXPERIMENT STATION

62. *General.*—Further progress in the development of the Station is recorded. With funds made available from a Colonial Development and Welfare grant, four senior and seven junior staff houses were constructed during the year. The main Library of the Department was moved to the Station and the Chemistry and other laboratories were equipped. All Specialist Officers are now permanently located at Centeno.

63. Field cultivation was also extended to include an additional 40 acres of fodder, 135 acres of irrigated land for pure line paddy production (financed by the Rice Expansion Programme), and an area on the North bank of the Caroni River for a collection of tropical fruit trees. In the cacao section, clonal nurseries have been established and plans are well advanced for the construction of a large cacao propagating station (financed by the Cocoa Board).

64. With funds voted as a result of the recommendations of the Local Food Production Committee, selected seeds and planting material were made available on the station. The livestock section was increased from 60 to 110 head of dairy cattle and preparations have also been made to accommodate a small herd of water buffaloes. Holding paddocks have been fenced and provided with water and shelters and approximately four miles of estate road have been laid down.

65. *Revenue.*—There was a substantial increase in revenue. For the past five years it has been as follows :—

1949	...	...	...	...	\$11,364.00
1950	...	...	...	...	26,503.50
1951	...	...	...	...	36,189.91
1952	...	...	...	...	41,618.56
1953	...	...	...	...	72,669.94*

66. The Cacao Section was increased by the addition of L'Esperance Estate which is on the eastern boundary of La Chaguaramas. The area now comprises some 900 acres, of which about 500 acres are in seedling cacao. About 200 acres have been earmarked for a 500,000 plant-per-annum propagating station, to be constructed by the Cocoa Board. Work on this project was commenced during the year. Reclamation work on the old seedling cacao progressed steadily and a crop of some 58,000 lb. of dried beans was reaped.

ST. AUGUSTINE STATION

67. *Weather.*—The dry season was somewhat short. It began late in January and continued until the end of April. The onset of the rainy season in May, the month in which the highest precipitation was recorded, was sudden. Thereafter, until the end of the year, showers were fairly evenly distributed except for a dry spell in October. Rainfall figures at this station for 1953 were as follows :—

<i>Jan.</i> <i>ins.</i>	<i>Feb.</i> <i>ins.</i>	<i>Mar.</i> <i>ins.</i>	<i>Apr.</i> <i>ins.</i>	<i>May</i> <i>ins.</i>	<i>June</i> <i>ins.</i>	<i>July</i> <i>ins.</i>	<i>Aug.</i> <i>ins.</i>	<i>Sept.</i> <i>ins.</i>	<i>Oct.</i> <i>ins.</i>	<i>Nov.</i> <i>ins.</i>	<i>Dec.</i> <i>ins.</i>	<i>Total</i> <i>ins.</i>
3.03	1.23	0.84	0.67	9.55	7.70	9.03	8.23	8.91	2.98	6.06	4.22	62.45

68. *Revenue.*—

<i>Year</i>	<i>Total Value</i>
1947	\$44,164.95
1948	46,832.16
1949	55,963.34
1950	62,998.00
1951	65,000.00 (approx.)
1952	65,058.30
1953	64,867.00

*This figure does not include revenue from cacao and coffee, respectively, amounting to \$36,000.00. It is recorded by the Cocoa Board which now controls the commercial cacao and coffee on the Station.

69. *Citrus*.—Lifting of citrus began with the start of the rains in May and continued to the end of the year. 99,090 plants were distributed which represented an increase of 30,039 and 1,401 over the years 1952 and 1951 respectively.

70. The number of plants held over this year was 39,570 as compared with 28,580 at the end of the previous year. Many of these were budded limes. There were some cancellations of orders, many of which were due to lands not being prepared in time. In other cases the number of plants ordered was in excess of actual requirements.

71. Approximately 190,000 seedlings of Sour Orange have been planted out for budding. Unfortunately, no seeds of Dominica Wild Grapefruit were obtained this year, but every effort is being made to secure a supply for the 1954 season.

72. Orders received for citrus plants for delivery in 1954 amount to 327,000 of which 159,761 are for Valencia orange, 21,283 for Navel orange, 52,026 for Marsh Grapefruit and 28,388 for West Indian Lime on Rough Lemon stock.

73. *Avocadoes*.—During the year 8,875 plants were distributed, 242 of which were on Free Issue.

74. Bookings for 1954 amount to 13,656, and it is expected that over 10,000 of these will be supplied.

75. *Mangoes*.—4,960 mango plants were distributed. Orders for 15,777 were received and 14,650 stocks were potted.

76. *Vegetables and Ornamentals*.—There was a decrease in the demand for vegetable seedlings which was probably caused by the short dry season. The demand for ornamentals again increased.

Total Distribution of Vegetable and Ornamental Seedlings for period 1951-1953

	1951	1952	1953
Vegetable seedlings (boxes) ...	8,434	9,450	7,971
Ornamental seedlings (boxes) ...	4,463	5,276	5,998

77. The number of potted flowering trees, shrubs and hedge plants distributed amounted to 47,617 of which 9,933 were on Free Issue.

78. *Orchard Crops*.—The citrus orchard was given two dressings each of 4 lb. of Sulphate of Ammonia per tree and cutlashed several times during the year.

79. Delivered during the year to the Co-operative Citrus Growers' Association were 6,335 crates of Marsh Grapefruit, 2,437 crates of seeded grapefruit and 529 crates of oranges.

80. Local sales amounted to 164,025 grapefruit and 69,859 oranges.

81. *Field Crops*.—With the aim of supplying good quality planting material, the following crops were grown.

(a) *Corn*—21,597 lb. of dry corn were harvested, most of which was sold to the Marketing Division.

(b) *Pigeon Peas*—763 lb. of dry pigeon peas were sold. The previous year's production was 1,096 lb.

(c) *Yam*—The yield of yams was over 39,000 lb. Most of this has been sold to the Marketing Division.

(d) *Tomatoes, Cabbage, Lettuce, Cauliflowers, &c.*—These have been grown on a larger scale than during the previous year. Returns were good.

82. *General*.—Miscellaneous crops including Sun Hemp, Wooly Pyrol, Cowpeas and Kudzu have been grown as usual for seed.

CROPS

CACAO

Clonal and Fertilizer Trials

83. Reference was made in the 1952 report to a series of field experiments, comprising both clonal and fertilizer trials, which are financed by the Cocoa Board. Two more experimental sites were established during the year, bringing the total number of sites in Trinidad to thirteen (13) whilst the number in Tobago remains at six (6). Routine operations were carried out and the programme is up to schedule.

Breeding and Selection of Witchbroom Resistant Clones

84. This work was continued at Marper Station and steady progress achieved during the year. Yield records were commenced on the 1950 plantings.

85. A total of 1,892 seedlings has been raised of which 1,562 were planted out. Clones SCA 9, SCA 19, PA 218 and SP 1 (formerly CC 7) were added to the list of parent trees used for crossing.

86. In accordance with the policy of duplicating certain experiments laid down at River Estate (Cacao Research—Imperial College of Tropical Agriculture), a shade, spacing, and fertilizer experiment was laid down during the year at the Central Experiment Station. The experiment is designed to compare (1) shade *vs.* no shade, (2) wide *vs.* close spacing and (3) fertilizer *vs.* no fertilizer. The area is approximately 11 acres.

Diseases

87. The incidence of Witches' Broom and Black Pod was heavy in 1953, particularly in the wet and low-lying areas. The campaign against Witches' Broom, sponsored by the Agricultural Society in Tobago, was continued but while the responsible element of the agricultural community remained co-operative, some compulsory action, under the Plant Protection Ordinance, was required. The following figures indicate the extent of compulsory action taken during the period 1951-3 inclusive.

Years	No. of Properties	Acreage	No. of Trees Treated			
			Flat Cut or Clear Felled	Half Felled	Pruned	Total
1951	4	314	10,191	—	5,848	16,039
1952	30	290	4,265	1,639	26,453	32,357
1953	7	224	46	470	25,116	25,632
TOTALS ...	41	828	14,502	2,109	57,417	74,028

88. The campaign to restrict the Virus disease to a small area in the Sangre Grande district has been continued and a total of 39 trees was destroyed during the year. While there has been no further spread there is, as yet, little sign of elimination. All of the Propagating Stations operated by the Cocoa Board have remained free from this disease.

CACAO SUBSIDY SCHEME (ADMINISTERED BY THE COCOA BOARD)

Principles

89. Variations of the Cacao Subsidy Scheme were approved during the year which :—

- increased the rates of subsidy payments (from an average of \$153.00 per acre to \$300 per acre, and from ten cents to thirty cents per plant) for planting clonal cacao;
- allowed lands which were cleared of cacao to plant foodcrops during the War Emergency to be considered part of the cacao acreage for the purpose of assessing subsidy payments;
- authorised payment for approved clonal cacao varieties produced in independent estate propagators and planted according to the Board's regulations;
- made compulsory the provision of permanent overhead shade for clonal cacao.

Rehabilitation

90. A total of 2,570 applications for rehabilitation of cacao have been registered, of which 2,361 have been approved to date. Of this number, 588 were received during 1953 and 573 approved. Of the applications received in 1953, 154 were from Tobago. The total approved applications for the years 1951-1953 were divided among estates as follows :—

Distribution, by size of Estate, of Approved Applications for Cacao Subsidy, 1951-1954

	At end of 1951	At end of 1952	At end of 1953
Estates under 25 acres	899	1,155	1,652
Estates 25/50 acres	178	218	262
Estates over 50 acres	373	415	447
TOTAL	1,450	1,788	2,361

91. The production of I.C.S. 1 fell to only 18% of the total (over 50% in 1952), whilst that of I.C.S. 95 and I.M.C. 67 rose to 50% and 10% respectively, the varieties I.C.S. 6, 8, 39, 40 and 60 being 8%, and other types (both local and imported selections) making up the balance.

92. In Tobago, however, the production of I.C.S. 1 is still over 60%, but nurseries of other types are being established.

Replacement

93. In 1953, 489 applications were received and 351 approved, bringing the grand totals to 2,471 received and 2,043 approved. The total approved applications for the years 1951-1953 were divided among estates as follows :—

Distribution, by size of Estate, of Approved Applications for Cacao Replacement, 1951-1953

	At end of 1951	At end of 1952	At end of 1953
Estates under 25 acres	949	1,209	1,493
Estates 25/50 acres	198	234	274
Estates over 50 acres	228	249	276
TOTAL	1,375	1,692	2,043

94. During the year, assistance was approved to plant 165.45 acres of citrus, 614.5 acres of coffee, 59.50 acres of other crops and \$5,744.42 was approved for livestock, fodder and pens.

Propagation

95. The average production efficiency of the Board's stations increased during 1953; this is largely due to the increase in material from "Home" nurseries.

96. All propagating bins were converted to use coconut bass residue. Generally, this medium has resulted in a marked increase in rooting, provided that the material does not remain in the bin too long. In Tobago, this material was not available after August, and it has been necessary to revert to washed sea sand.

97. Open bin propagation was continued only when there was an excess of cutting material, this being mainly in the wet season. The production efficiency of this method was lower than that of closed bin propagators. Most of the plants propagated were from stem cuttings, but single-leaf and two-leaf material were utilised throughout the year for the rapid multiplication of clones in short supply. Some 30,000 plants were produced, the two-leaf method having the advantage of quicker growth after rooting.

98. Trials were commenced in which both single leaf and stem cuttings were rooted and hardened in the same bin, the cuttings being set in individual baskets and potting soil being used as the rooting medium. This method is very promising (giving an efficiency of 70% on a small scale) and has the advantage of requiring less labour.

Propagating Stations

99. *La Pastora*.—Production for the year was 378,507 plants, as compared with 288,953 in 1952. The overall efficiency was 47%, as compared with 35% in 1952.

100. Difficulty was experienced through the lack of good potting soil. However, this has been overcome with the taking over of the L'Esperance section at the Central Experiment Station, Centeno, which has an adequate supply of good topsoil.

101. Some 13,891 plants were set in nurseries during the year, as compared with 15,228 in 1952. Of these, 8,859 were planted in new nurseries (Ribeiro section), whilst 5,032 were planted in areas in which old nurseries of I.C.S. 1 and I.C.S. 95 had been cut out.

102. *Marper*.—Production for 1953 was 47,874 plants, as compared with 40,005 during 1952. Production was achieved at an overall efficiency of 49.6 per cent. as compared with 48 per cent. in 1952.

103. Some 1,969 plants were set in nurseries during the year in fields from which S.C.A. 6 had been cut out.

104. *King's Bay*.—Production for 1953 was 20,267 plants, as compared with 33,288 during 1952. This was obtained with an overall efficiency of 25 per cent., as compared with 40 per cent. in 1952, the drop in production and efficiency being due to unfavourable weather conditions, the lack of good quality cutting material, and the unavailability of bass residue.

105. Some 2,718 plants were set in nurseries, 2,478 in new nurseries at King's Bay and Louis d'Or, the balance being supplies to the previous year's plantings.

106. *La Reunion*.—The construction of this station was delayed due to lack of technical engineering advice. However, the site was cleared and roads and drains were constructed for half the station during the year. The revised plans are that this station will commence propagation in June 1954 and should be in full operation by 1957.

107. Some 14,602 plants were set in nurseries.

Estate Propagators

108. Two new estate propagators (assisted type) were constructed in 1953. These were San Antonio, 10,000-plant capacity, which commenced propagation in August; and Mon Valmont, 18,000-plant capacity, which was completed at the end of the year and should start production early in 1954.

109. In addition, the propagator at San Juan Estate was extended from a capacity of 10,000 plants to one of 25,000 and the propagator at El Salvador was extended to provide 17,500 instead of 10,000 plants. The extension of Non Pareil to a capacity of 60,000 plants per annum was commenced and will be finished in 1954.

110. A most encouraging feature was the initial successful operation of estate propagators which produced 80,531 plants in the year, as compared with 43,169 in 1952. This production was achieved with a high efficiency, ranging from 50 per cent. to 80 per cent. Some 3,419 plants were set in nurseries for estate propagators.

111. At the end of the year, there were eight estate propagators in operation.

Cost—Plant Production

112. The following figures show the average cost of production of one plant :

		<i>Average Cost of Producing One Plant</i>		
		1951	1952	1953
La Pastora	...	65c.	76c.	71c.
Marper	...	81c.	69c.	68c.
El Salvador	...	—	75c.	52c.
San Juan	...	—	—	49c.
San Jose	...	—	—	72c.

113. There was a decrease in the cost of plant production during 1953 and this is attributable to increased efficiency in propagation. The figure for San Jose is misleading in that operations for the first half of the year were carried out at a low efficiency due to an unsuitable water supply.

Plant Distribution

114. Of the plants distributed during 1953, 400,709 were delivered to planters and 59,529 utilised for nurseries and experimental work; full details are given in Table XIV.

SUGAR CANE

115. At the Central Experiment Station, approximately 48 acres of cane were reaped and the average yield was 39.50 tons per acre.

116. Planting during the year consisted of multiplication plots of varieties of the B.50', B.49', B.48', B.47', B.46' and B.45' Series as well as the establishment of two Variety Planting Trials (B.48' and B.49' Series) and a Fertilizer Trial.

117. Over 45,000 cuttings of varieties of the B.49', B.48' and B.47' Series were distributed to the various sugar estates for further multiplication and trial.

118. Twenty-four field experiments, comprised of six fertilizer and eighteen variety trials were reaped in Trinidad during the year. In the variety trials, B.4098 performed well, both as plant canes and as ratoons, at the Usine Ste. Madeleine but elsewhere its yields were indifferent; in juice quality it was, on the average, slightly inferior to B.37172. B.41227 outyielded the standard varieties, B.3337, B.37161 and B.37172, in seven ratoon trials; its juice quality was, on the average, better than that of B.3337, but inferior to that of the other standard varieties. B.4362 gave only average yields of plant and ratoon cane and in juice quality it was extremely variable. Both B.43337 and B.43391 gave good yields but their juice quality was appreciably inferior to that of all of the standard varieties. Of the more recent varieties which were reaped in plant cane sorting trials, the following gave significantly higher yields than the standard varieties :—B.45152, B.4503, B.4596, B.45267, B.46223 and B.47419.

119. The varietal position during the year was as shown in Table XV. It will be noted that there is a considerable reduction in the acreage planted in B.34104 and that the newer varieties B.41227 and B.4362 are being extended.

120. *Ratoon Stunting Disease.*—During the year Dr. D. R. L. Steindl, Pathologist of the Bureau of Sugar Experiment Stations, Queensland, made a rapid survey of the sugar area and reported that he had found typical symptoms of Ratoon Stunting disease on three estates and on the Central Experiment Station; in addition he reported that Chlorotic Streak disease was extremely prevalent. The necessary steps for establishing "clean" nurseries at the Central Experiment Station are being undertaken.

Citrus Survey

121. Visits of inspection were made to orchards on 59 estates of varying sizes and observations were made on the cultural and other practices prevailing on 1,385 acres of grapefruits, 667 acres of oranges, 8 acres of lemons and 15 acres of budded limes.

122. It was found that there did not exist any standard techniques in the citricultural methods employed by growers. Orchard management practices ranged from highly intensive, in a few instances, to almost complete neglect.

123. The survey was not detailed in any respect and the findings were of a general nature. They have served, however, as a rough guide to the planning of the citrus research programme of the Department and can be useful as a starting point for specialised surveys in the future. An account was published in the *Supplement to the Proceedings of the Agricultural Society of Trinidad and Tobago* for the quarter ended 30th September, 1953.

*Citrus Experiments**(a) Minor Elements*

124. The minor element treatments were continued and records were made of the fruit harvested from individual trees. From visual observation of the trees, it was seen that the Zinc and Nitrogen applications improved the colour and quantity of foliage; Magnesium and Manganese did not, apparently, have any easily noticeable effect.

(b) N.P.K. Trials

125. The May application of fertilizer was on time but rainy weather resulted in the postponement of the October application for about three weeks. Nitrogen was applied to all trees in the experiments so that effective comparison between the Phosphate and Potash treatments only are expected of the results.

126. Incidence of scab was high in the experiment and it was observed that the nitrogen-treated trees were more seriously affected. Fruit size was greater in potash-treated plots than in others.

(c) Varying Nitrogen

127. No striking differences were discernible between trees receiving different nitrogen treatments; higher drop and lower total yield of the control trees were, however, readily apparent.

(d) Covercrop Trial

128. Imperfect establishment of the covercrops and initial variation in the grapefruit trees in the experiment render difficult the assessment of the true effects of the treatments. Tropical Kudzu produced a superior ground cover to the other legumes and, like the Toco grass, required pulling back from the trees at intervals of six to eight weeks. *Stylosanthes* grew satisfactorily in the shade where it had caught but *Indigofera* was established only with difficulty under all conditions.

129. Shedding of fruit, both June drop and pre-harvest drop, appeared to be less severe in the plots under Toco grass cover than in others.

(e) *Rootstock and Management Trial*

130. The growth of trees set out in 1951 and 1952 was variable and several deaths occurred in 1953. Some supplies of the specific rootstock scion combinations in the plots were available and these were put in but several gaps still remain and it has been necessary to make special arrangements to have plants propagated for filling these in the future.

131. Girth measurements gave a rough indication that, in oranges and grapefruits, more vigorous growth occurred on rough lemon than on other rootstocks. Great variability was, however, observed with all rootstocks. It was least with the Cleopatra Mandarin, on which the plants appear to grow rather slowly. Several of the limes died-back to the bud union in combination with sweet and sour orange rootstock but no significance can be attached to this observation as the original plants are believed to have been weak.

132. Weed control with herbicide was not entirely satisfactory. In spite of heavy applications of commercial preparations containing pentachlorophenol, a thorough kill of weeds could not be obtained and those remaining after spraying were pulled by hand to obtain the weed-free condition required.

133. The permanent cover of Tropical Kudzu is now well established in the appropriate plots. To ensure this a considerable amount of effort had to be directed to digging out Para grass, Donkey grass and Razor grass—three very noxious weeds on the Station.

(f) *Transplanting Trials*

134. A series of trials to determine the practicability of establishing citrus orchards under Trinidad conditions by planting "bare-root" nursery trees was commenced in June. Plots were laid down on the Imperial College of Tropical Agriculture farm, at El Reposo Demonstration Station and on private estates in the Sangre Grande and Talparo areas, as well as at the Central Experiment Station.

135. Plants dug and transported "bare-root" from the St. Augustine nursery were set out alongside others dug "en pilon", in experimental plots arranged in randomised block layouts, and observations were made on percentage takes, on rate of growth and on costs involved in bringing the trees into bearing.

136. Data already collected suggest that there is no appreciable difference in the survival rate up to six months from planting. It will be necessary to submit the figures to statistical analysis before definite conclusions can be drawn, and measurements are due to continue for about five years.

(g) *Tree Management Trial*

137. An investigation of the effect of training Valencia orange trees to a pre-determined shape is now in progress. The following treatments are being applied to young Valencia orange plants, set out in September at El Carmen:—

(a) Control—no training;

(b) Headed at planting;

(c) Training to shape, in the field, during growth subsequent to planting.

138. It is planned to record costs and make measurements of growth rates, earliness and ultimate yields.

Citrus Collection

139. A museum collection of citrus species and varieties, of potential economic importance to Trinidad, was started at the Central Experiment Station. *Poncirus trifoliata* and *Citrus ichangensis*, which may prove useful rootstock plants, were introduced from Jamaica and the plants of the St. Augustine citrus collection are to be duplicated at Centeno.

140. Plants of a so-called "Bergamot" variety, grown from budwood obtained in Tobago in 1952, are under observation and comparison with seedling progeny of a known Bergamot tree growing in Jamaica. Several plants of the Tobago "Bergamot" apparently sported in the bud since they developed into plants on which oil glands are absent.

Nursery Observations

141. Seed of several types of rootstock were sown at El Carmen in an attempt to determine whether citrus nursery operation is practicable at the Central Experiment Station as a supplement to production at the St. Augustine nurseries. These have been unable, in the past several years, to supply the full requirements of citrus growers. Cocopeat was used as a seedling medium and seedlings of Sweet Orange, Rough Lemon, Rangpur Lime, Dominica Wild Grapefruit, Sour Orange, Bittersweet Orange and West Indian Lime have been grown. Preparations have been made to transplant these to nursery rows where they are to be used for budding with different scions to study rootstock-scion relationships.

142. There are indications that the heavy Cunupia Clay at El Carmen may not be suited to the satisfactory development of citrus nursery plants since the root systems of seedlings, to be used as rootstocks, are largely defective. This results in a high percentage of rejections at transplanting. Sowings on the silts of La Reunion are likely to yield better results.

Dying-Out Disease of Limes

(a) *Glasshouse Studies*

143. At the La Reunion glasshouse, observations were continued on West Indian lime seedlings growing in pots. It was found by the Plant Pathologist that a discoloration of the central stele was present in those seedlings which

were branched at an early age whereas unbranched seedlings possessed no discoloration. This discoloration was associated with the presence of a *Fusarium* sp. but causes none of the symptoms of Dying-Out Disease in the glasshouse. A selection of branched seedlings was removed and set out together with the same number of unbranched seedlings in a plot at El Carmen for further observation. There were no apparent differences in growth up to three months from planting.

144. In another pot experiment thirty straight unbranched seedlings from a known healthy stock were divided into two equal lots. One lot was planted in virgin soil, the other in soil in which healthy lime seedlings had been grown for some time and had then been removed, leaving fragments of roots. After six weeks it was seen that the general health of the seedlings in the virgin soil was better than the health of the others; at three months seven seedlings in used soil had died as compared with two of the others. No active pathogenic organism was discovered in any of the dead plants, but the dying of the lime seedlings bears some resemblance to experience with peaches in the United States. There, young peach trees die within a short time when set out in soil in which peach roots are present, irrespective of the presence or not of disease. This suggests another angle to the Dying-Out Disease problem as it may be possible that plant antagonisms and antibiotic relationships of limes may be involved.

(b) Soil Transmission Trial

145. No success has been obtained in attempts to transmit Dying-Out Disease to healthy lime plants by growing them, at the Piarco plot, in soil transported from an Erin field where the disease is prevalent. Rooted cuttings from diseased trees have also not shown symptoms of Dying-Out.

(c) Graft Transmission Trial

146. Healthy seedlings were budded at El Carmen with scions taken from diseased trees and grown alongside unbudded seedlings and rooted cuttings from both healthy and diseased trees to obtain information on possible transmissibility by means of grafts. Several rebuddings were required on account of the low vigour of the scions but, after union, the budshoots have grown satisfactorily. There were, three months after budding, no recognisable symptoms of Dying-Out Disease on any of the plants.

Withertip Resistance

147. Twenty-four plants of the strain of West Indian lime found resistant to Withertip Disease, being grown under observation at El Carmen, have remained free of symptoms of Withertip. It is planned to carry out tests on the suitability of the limes for commercial purposes when these trees come into bearing.

ANNUAL CROPS

RICE

Rice Expansion Programme

148. Work on the four major rice expansion schemes continued throughout the year and it is hoped that the basic engineering works at Plum Mitan, Fishing Pond and Caroni Savannah will be completed by June, 1954. The levelling of the last terrace of the Central Experiment Station scheme should also be completed in the early dry season of 1954 and will bring to a close all capital works on this particular scheme.

Pure Line Paddy Production in 1953

149. The following four varieties were produced in 1953 for distribution in May and June 1954 to rice farmers in the districts:—

D.85/42, D.52/37, D.110 and Sughandi.

150. In view of the disappointing results of D.85/42 in 1953, however, it has been decided not to distribute this variety in 1954. The three remaining varieties are now known to be well suited to local conditions and capable of giving very satisfactory results. More than ample quantities of seed of all varieties were produced on the Central Experiment Station in 1953 and are now in store. Considerable quantities of hill rice seed were also produced as a demand for this seed was noted in 1953.

Pure Line Paddy Distribution in 1953

151. The following amounts of seed were distributed to some 322 farmers in Trinidad :—

<i>Variety</i>					<i>Lb.</i>
D.52/37	...	..	...	...	10,282
Sughandi	...	...	...	...	3,668
D.110	...	...	...	...	2,348
D.85/42	...	...	...	...	605
Total				...	16,903

Freeman Road Rice Station

152. 1953 was the last year of operation of the Freeman Road Rice Station. This Station has served the Department well for several years and has achieved a reputation for the production of high quality rice. The location, however, made its continued use unsatisfactory and all work has now been transferred to the Central Experiment Station, where ideal water conditions are available. Eleven acres have been developed at Central Experiment Station for experimental work and elite seed production for the large pure line paddy block. A satisfactory crop was obtained in 1953, but several years will be required to build up this land to a first-class condition.

Seed Production

153. Work on the establishment of pure line seed has again formed a prominent part in the rice programme. The following quantities of high grade seed are available for planting at Central Experimental Station's pure line paddy block in 1954.

Sughandi	...	...	...	...	3,000 lb.
D.52/37	...	...	...	...	3,200 lb.
D.110	...	...	...	...	1,600 lb.
Red American	...	...	...	...	1,600 lb.

Variety Trials

154. At Freeman Road two variety trials were laid down.

155. *Trial 1.*—This trial was laid down to test the performance of Surinam standard varieties against British Guiana and local varieties. Unfortunately sufficient seedlings could not be obtained for the two Surinam varieties Sknifimankoti and Mas as seed supply was very short. These two varieties have given very good results in Surinam and will be put into trial in 1954. The varieties employed were Bengawar (Surinam), D.85/42 (British Guiana), D.54/42 (British Guiana), D.52/37 (British Guiana) and Sorro (Trinidad). Good uniform growth was obtained and harvest conditions were satisfactory.

156. Yields obtained were as shown in Table XVI and significant differences were obtained between D.54/42 and Sorro and the three other varieties.

157. *Trial 2.*—This was laid down to test the yield of American bred varieties, imported from Surinam against varieties that have performed well in Trinidad. These American varieties are being used in Surinam as commercial varieties for mechanical cultivation. Previous trials have shown that there is little prospect of success for such in Trinidad. This is difficult to understand and this trial has only confirmed previous experience no further light having been shed on the situation. The varieties employed were—

Bolo	
Sughandi	
Rexora	} U.S. varieties from Surinam
Fortuna	
Blue Bonnet	

158. Yields obtained were as shown in Table XVI. No analysis of this trial was carried out as these yields are more than self evident. There are two possible explanations for the low yield of the American varieties :—(a) that the plant density as put out in this trial is much too low or (b) that their fertility requirements are much greater than those prevailing at Freeman Road Station. It is also possible that transplanting of these varieties hinders their development as they have been bred specifically for drilling and mechanical harvesting.

159. A fertilizer trial to investigate residual effects from the previous year was also laid down at Freeman Road, in an attempt to complete the series of such trials on that site. In effect the area occupied by the trial in 1952 was planted up again in 1953 and an analysis was carried out on the basis of the 1952 design. No significant differences were obtained although yields were somewhat lower, which is accounted for by the absence of nitrogen in 1953. The most noticeable feature of this trial was the remarkable constancy of the results and the extremely low error variances obtained throughout. From the results of the past four years it appears that the only effective manure is nitrogen, and this reaches a ceiling value round two hundred-weight per acre, with a yield in the region of 3,500 lb. per acre. It would appear that some other factor becomes limiting at these figures. It is possible that this factor may be a trace element or it may simply mean that the variety has reached its peak production under the given conditions of soil and daylight. It is interesting to note that the year to year effect is comparatively small. In fact between 1951 and 1952 where conditions were strictly comparable the overall difference in yield was 4 lb.

160. The assemblage and classification of local Trinidad varieties continued.

Maize

161. The improvement of the seed maize continued. 1,845 lb. of selected seed was retained from a total of 35,561 lb. harvested for selection. This available as seed material for distribution.

Other Food Crops

162. Cassava and Pigeon Peas from selected material are available.

Cover Crops

163. Several introductions are showing some promise under Trinidad conditions. A thornless variety of *Mimosa invisa*, imported from Java, seems to have possibilities, both as a cover and a fodder. *Desmodium gyroides* has promise as a cover crop, being both erect and spreading.

Fibres

164. Work on Cotton and Kenaf has been discontinued.

Sisal

165. Plantings of *Agave funcroides*, on Piarco Sand Soil Type, are apparently thriving.

Grasses

166. Many species of grass have been imported, during the year, of both grazing and fodder types. Pangola Grass (*Digitaria procumbens*) and Lukuntu Grass (*Ischmaeum timorense*) show promise.

Fodders

167. Kudzu (*Pueraria Phaseoloides*) has been successfully grazed, as a pure stand, during the year. Increased acreages of this legume are proposed in 1954. Other fodders that have been introduced are *Indigofera hirsuta*, *I. pilosa*, *Alysicarpus vaginalis* and *Lespedeza spp.*

Tropical and Sub-Tropical Fruits

168. A museum collection of useful tropical and sub-tropical fruits was commenced and, in addition to a number of species already grown in Trinidad, others were introduced from Jamaica during the year. The first plantings were made in July and consisted of three varieties of Adriatic fig (*Ficus carica*), White Sapote (*Casimiroa edulis*), Natal Plum (*Carissa grandiflora*), two varieties of breadfruit (*Artocarpus Communis*), Akee (*Blighia sapida*) and soursop (*Annona muricata*). Observations are being made on their ability to grow and produce under the conditions existing at the Central Experiment Station and extension to include a large number of other species is planned.

SOIL SURVEY

Trinidad

169. 18,000 acres were surveyed in the Ward of Moruga and Ortoire during the year. Dominant soils found in this area were Moruga loam, and Ecclesville and Talparo clays. Three new soil series were described.

Tobago

170. In the absence of the Soil Chemist for the greater part of the year, the Soil Survey Officer (Tobago) was recalled to act in that post. No survey work was, therefore, carried out in Tobago during the year.

171. Two thousand three hundred and sixty-one analyses were made in the Soils Laboratory during the year. In addition to these, analyses were carried out in connection with Red Ring disease investigations.

Soil Conservation

172. Run-off plots at L'Esperance, Central Experiment Station, for the measurement of soil loss and run-off, under different cropping systems, yielded useful data during the wet season. Basic data obtained from the plots are shown in Table 17.

173. Work was started on the construction of a similar set of plots on Princes Town Clay at Rio Claro Station.

174. Four plots for the study of run-off and erosion in sugar cane fields were established at the Central Experiment Station.

175. In co-operation with the Forestry Department, three watershed sites were chosen for the study of erosion in natural forest, teak nurseries and established teak.

176. Two watersheds at Five Rivers were selected for the comparison of run-off and erosion under shifting cultivation and conservation farming.

177. Work on the Land Use Demonstration at Maracas Land Settlement proceeded satisfactorily during the year.

LIVESTOCK

Animal Health

Incidence of Animal Diseases in the Caribbean

178. The Animal Diseases Reporting Service of the Caribbean Commission continued to operate during the year. The summary of reportable diseases as occurring in this Colony during the year is shown in Table 18.

Proclaimed Diseases

Paralytic Rabies (Bat-transmitted)

179. The number of reported cases was 42 as compared to 99 in 1952. There is no doubt but that other cases occurred which were not reported. The actual effects of this disease were less than in the previous year and the incidence, with minor exceptions, was confined to the same areas.

180. The application of protective vaccination and bat destruction measures was continued during the year. The following classes of livestock were vaccinated :—

<i>Cattle</i>	<i>Water Buffalo</i>	<i>Horsekind</i>	<i>Goats</i>	<i>Total</i>
3,205	96	788	416	4,505

181. During 1952 a total number of 7,204 animals was vaccinated.

182. Preliminary investigation was carried out on the use of the avianised vaccine (modified live virus-Lederle) and a summary of this is given under Investigational Work.

183. A certain number of livestock owners, mostly peasant, continue to refuse to present their animals for vaccination or to assist in the diagnosis of the disease by allowing brain material to be collected. In this connection, consideration is being given to regularise these practices by appropriate legislative control.

Newcastle Disease

184. It is gratifying to record that poultry-keepers, throughout the Colony, are now aware of the seriousness of this disease and are taking active steps to control it as far as possible by vaccination. Inasmuch as the highest degree of infection has been observed in broiler chickens, the vaccination of day-old chicks, using a BI intra-nasal vaccine, has been very effective.

185. The two Stock Farms within the Department vaccinate all chicks sold before delivery and the larger hatcheries continue their practice of carrying this out at the option of the purchaser.

186. As a result of experiments carried out during the year, a system of simultaneous vaccination against this disease and fowl pox in baby chicks was developed. A summary of this is also given under Investigational Work.

187. In view of the barrier of protection which is being gradually built up among pure-bred stock, in which class the disease is mostly observed, the situation is improving and it seems reasonable to expect that over a period of years, a fair degree of resistance will be established amongst local flock.

Swine Fever

188. It is gratifying to record that no cases of this disease were observed during the year.

189. Protective vaccination was carried out as a routine measure of control, especially in those areas in which the disease had previously occurred. A total number of 1,458 pigs were vaccinated, as compared to 1,206 during 1952.

190. Preliminary trials are being carried out with the use of one of the modified live virus vaccine—ROVAC (Lederle). This is being done to assess its value as compared to the routine method of using crystal violet vaccine.

Tuberculosis

191. Table 19 shows the numbers, classes and percentages of reactors to the tuberculin test carried out during 1951-53.

192. Under local health regulations, 1,876 dairy cows and heifers were tested, of which 11 gave a positive reaction, a percentage of 0.6. Corresponding figures for 1952 were 2,313 tested, 38 reactions a percentage of 1.64.

193. Routine tests were carried out in the cattle herds at the St. Joseph Stock Farm and the Tobago Farm. The results were :—

		<i>No. tested</i>	<i>No. reactors</i>	<i>% reactors</i>
St. Joseph Farm	...	350	3	.86
Tobago Farm	...	122	—	0.0

NON-PROCLAIMED AND PARASITIC DISEASES

Trichomoniasis

194. A routine survey on 20 bulls, examined by sheath washings, disclosed that 75 per cent. were infected with *Trichomonas foetus*; 14 on first examination and 1 on the third examination. The organism was not found in 8 bulls similarly examined in Tobago, 7 of which were examined three times and one twice.

Poultry Diseases

195. In addition to the incidence of Newcastle Disease, Fowl Pox, Caecal Coccidiosis, Malnutrition and Parasitism were all observed.

Miscellaneous Diseases

196. These were very similar to last year and included Tetanus—horses, pigs and goats; Strangles—mules; Anaplasmosis and Piroplasmosis—cattle; Acetonemia—cattle; Milk Fever—cattle; Bovine and Equine Indigestion; Mastitis—cows and goats.

Parasitism

197. The usually high degree of internal parasites was observed, especially in sheep and goats. A start is being made in preparing a host list of these parasites, in the several classes of livestock, in an effort to determine the different parasites involved and to apply a more specific form of control, both by treatment and by pasture rotation.

Veterinary Practice Service

198. The Local Food Production Committee recommended that Veterinary Officers of the Department should be allowed to undertake private practice as a service to livestock owners in distant rural areas under certain conditions. This service was initiated early in the year.

199. Four officers, stationed in the Northern, Southern and Eastern districts, respectively, and in Tobago, carried out the service. A total number of 374 calls were made to farm animals. Fees amounting to \$1,558.44 were paid into general revenue.

Veterinary Diagnostic Laboratory

200. A total number of 6,322 specimens were handled at the laboratory during the year. These were as follows :—

Milk	...	...	...	...	5,210 samples were tested for butter-fat, Resazurin grading, phosphatase test and bacteriological examinations.
Faecal examination	...	...	...	220	
Serological tests	...	...	...	756	
Blood smears	...	...	...	8	
Poultry autopsies	...	...	...	100	
Miscellaneous	...	...	...	28	

Investigational Work

201. During the year the following projects were undertaken :—

(A) Preliminary Survey on the Blood Chemistry of Cattle

Determinations were carried out on the contents of Calcium, Phosphorous, Magnesium and Haemoglobin. Samples were collected from various classes of cattle, e.g., pregnant and non-pregnant cows; lactating and non-lactating cows; pregnant and non-pregnant heifers, heifer calves; bull calves; steers and bulls.

202. A total of 296 samples, distributed over the main four soil groups which are considered as representative of Trinidad (*see* diagram opposite Table 20), were collected and subjected to analysis.

203. In the absence of acceptable standard values of these blood constituents for cattle in the Caribbean area, no attempt is made to compare the results obtained with values for those elsewhere, especially in temperate countries.

204. It would seem reasonable to point out that the soil type does not appear to have contributed any appreciable effect to the results, except perhaps with regard to haemoglobin levels. In this connection, however, other workers have concluded that there is marked variation in this level elsewhere in the tropics.

205. It should also be pointed out that there were some low magnesium levels and, in the absence of further investigation, it may be possible that these represent seasonal hypomagnasemia cases without clinical symptoms.

206. This preliminary survey was initiated to obtain some information as to normal blood levels for these constituents before proceeding to conduct further studies on the effect which, if any, local standards of nutrition bear to reproductive efficiency in cattle.

(B) *Observations on simultaneous vaccination of three-day old chicks against Fowl Pox and Newcastle Disease*

207. Controlled experiments were carried out to determine—

- (i) the safety factor in vaccinating three-day old chicks against Fowl Pox;
- (ii) the protective value of vaccination at this stage; and
- (iii) whether such vaccination could be carried out simultaneously with that against Newcastle Disease without affecting the efficiency of either vaccine.

208. Two hundred three-day old chicks, divided into four groups of fifty each, were used and treatments comprised the vaccination of one group against Fowl Pox and Newcastle Disease, of a second against Fowl Pox, and of a third against Newcastle Disease, while a fourth group remained unvaccinated against either disease.

209. The results from this preliminary experiment showed that vaccination, as carried out against Newcastle Disease, could also be carried out against Fowl Pox in three-day old chicks.

210. The second series of experiments comprised the challenge of the vaccinated chicks, four weeks after vaccination, and of the control group, with the specific viruses which cause these two diseases.

211. The results from these experiments showed that the vaccination of three-day old chicks against Fowl Pox was safe and effective in affording protection against this disease, and that this degree of safety and efficiency is not reduced or disturbed by the simultaneous application of vaccination against Newcastle Disease. Conversely, the value of protection against Newcastle Disease is not reduced or disturbed.

212. The methods of vaccination used were the intra-nasal route in Newcastle Disease, using a BI strain, and the wing-web stick method in Fowl Pox, using a standard commercial strain of vaccine.

213. Further particulars of this experiment are to be found in Departmental Bulletin No. 6 (1953).

(C) *Observations on the immunological value of modified live virus (avianised) Rabies vaccine (Lederle) against Paralytic Rabies in Cattle*

214. Rabies, Paralytic (Bat-transmitted) takes a heavy toll against live-stock in Trinidad, chiefly cattle, and the availability of a vaccine which would provide a more quickly established and longer lasting resistance than that presently used would be of great value. Through the kindness of Messrs. Lederle Laboratories, a supply of their modified live virus (avianised) vaccine was made available.

215. Two groups of susceptible calves, five to each group, were used in this experiment. One group was vaccinated with 3 cc. of the reconstituted vaccine intra-muscularly. The viability of this vaccine had been previously determined by passage through adult and suckling mice. Nineteen weeks later, all 10 calves were challenged with 5,000 mouse M.L.D.50 of a previously titrated strain of paralytic rabies virus isolated from a cow which had died from this disease. The challenge dose was injected into the masseter muscles. Daily observations and rectal temperatures are being recorded and the experiment is still under way.

216. The Department is most grateful to Drs. Downs and Anderson, of the Trinidad Regional Virus Laboratory, for their valuable assistance and co-operation in carry out this experiment.

(D) *Observations on the value of antibiotics in the feeding of runt pigs*

217. Trials were carried out with a limited number of runt pigs to determine the value or otherwise of including an antibiotic supplement in their feed.

218. Aurofac (Lederle) was used in the experiment which included eighteen young pigs divided into three groups.

Group I — Six runt pigs—Regular feed + 1% Aurofac

Group II — Six normal pigs—Regular feed + 1% Aurofac

Group III — Six normal pigs—Regular feed only.

219. The following table shows the respective weights of each group before and after the trial, which was of six weeks' duration, with percentage gains.

Group	Total weight before trial lb.	Total weight after trial lb.	Total weight gain lb.	Weekly weight average lb.	Average weekly per cent. weight gain
I	102	223	121	20	19.8
II	135	267	132	22	16.3
III	140	274	134	22	16.0

220. This experiment has confirmed similar results obtained elsewhere that while the use of antibiotics is of full value in the feeding of runt pigs, there is little or no effect on pigs of normal growth for their age.

(E) Trials to determine the Value of Rumen Ingesta inoculations in hand-fed calves as reflected in weight gains

221. A review of recent literature indicates that hand-fed calves may be retarded in growth because of incomplete rumen flora as a result of non-contact with adult cattle.

222. A small experiment was initiated at the St. Joseph Stock Farm to determine the effect, if any, on the rate of weight gain, of inoculating hand-fed calves with rumen ingesta from healthy adult cattle. Hand-fed calves are weaned at six months of age at this Farm.

223. The experiment involved five pairs of calves, each pair of similar sex, grade and approximately the same age. These were weighed weekly for five weeks, at which time the calf of each pair which had made the least weight gain was inoculated with rumen ingesta taken from three healthy adult cattle.

224. The inoculated and non-inoculated calves were isolated but maintained under similar conditions in every respect, and were weighed for a total of twenty-six weeks.

225. An analysis of the results shows that 60 per cent. of the inoculated calves showed rates of gain varying from 25 to 42 per cent. over their better partners during the twenty-one weeks following inoculation, while the remainder of the inoculated calves (40 per cent.) were brought up to slightly better efficiency than their originally better partners. It would appear that inoculations should not be carried out in calves under the age of 4 months. As the results are promising, a similar trial involving a larger number of calves is being conducted.

ANIMAL HUSBANDRY

Livestock Shows

226. The following livestock shows were held during the year :—

- (i) Nine Cane Farmers' and Peasants' Shows in the Sugar Belt area;
- (ii) The Tobago District Agricultural Show;
- (iii) The Trinidad Goat Society's Twelfth Annual Show;
- (iv) The Naparima District Agricultural Show.

227. At all these shows representative animals from both Stock Farms were sent for exhibition and improved methods of husbandry were demonstrated. The several Veterinary Officers and Livestock Inspectors assisted in judging the exhibits.

Breed Improvement

228. Table 21 gives details of the 5,095 services by selected sires, to privately-owned females, at the two Stock Farms and District Breeding Units in Trinidad and Tobago.

229. The services of selected sires to Government-owned animals on Stock Farms and District Stations are not included in Table 21; nor are those of the pure-bred Sahiwal bulls which were made available in Tobago at approved estates.

230. In continuation of the policy to increase numbers of breeding females, especially cattle there was no annual sale of livestock. Accordingly, sales were confined, on both Stock Farms, to bulls, young pigs and poultry for breeding purposes, eggs for hatching and eating and to all culls and undesirable types of the several classes of livestock. These are shown in Table 22.

STOCK FARMS

Cattle

231. There was no change in the breeding policy which is outlined below :

St. Joseph Stock Farm

- (a) The garding of pure-bred Zebu cows to pure-bred Holstein bulls;
- (b) The inter-se breeding of half and three-quarter Holstein-Zebu grades, with emphasis on the former grade.

232. During the year, a start was made on the collection of breeding records with a view towards the closing of the herd and the selection of outstanding families for the establishment of a carefully framed breeding programme.

Tobago Stock Farm

233. The breeding of pure-bred and high-grade Sahiwal cattle.

234. There were no major changes in the system of management in which the maximum use is made of outdoor management and also of the use of good quality fodder.

235. Routine disease control measures included regular tuberculin-tests, serum-agglutination tests for Brucellosis, vaccination against Rabies, faecal examinations, coupled with monthly dosing of young stock against internal parasitism, and the control of external parasites.

Cattle Strength

236. Cattle strength on the two Stock Farms at the end of the year is shown in Table 23. Calves born during the year are shown in Table 24.

Milk Production

237. Total production amounted to 72,475 gallons—66,471 in Trinidad and 6,004 gallons in Tobago. This total figure represents an increase of 3,773 gallons over the previous year.

238. The sale of milk, consisting of Farm production, surplus to that required for calf feeding, supplemented by purchases processed for resale, amounted to 79,903 gallons. This milk was distributed amongst hospitals, schools and other institutions.

239. Table 25 shows the comparative St. Joseph Stock Farm production for the years 1949-1953.

240. While there was a drop on the record production of 1952, yields on the whole were satisfactory. Contributing factors to the decrease were the discontinuance of thrice-daily milking and reduced grazing facilities, brought about by the addition of the Jamaican importations. This latter factor was well illustrated by an increase during the last quarter of the year following the transfer of this group elsewhere.

241. The performance of 24 first-class heifers, while not as high as the previous year, was satisfactory—a daily average of 2.6 gallons.

Cattle Imported from Jamaica

242. There were no further importations during the year but arrangements were finalised to receive another shipment by air early in January, 1954. The purpose of these importations is to increase the number of breeding females within the Department's cattle strength whereby increased numbers of progeny for sale to the public will be available.

243. These animals have been distributed between the two Stock Farms and the cattle breeding unit at the Central Experiment Station at Centeno.

244. Milk production amounted to 10,136 gallons and is included in total production. Calvings numbered 35—22 bulls and 13 heifers.

CATTLE BREEDING UNIT AT THE CENTRAL EXPERIMENT STATION, CENTENO

245. The strength at this centre was considerably increased and at one period reached a maximum of 152 head, of which number 61 represented dairy heifer calves transferred from the St. Joseph Farm for rearing.

246. The pen and byre improvements included a dairy byre to accommodate 34 cows in stanchions equipped with automatic drinking bowls. Another byre provided sixteen calf pens, four calving boxes and a store. In addition, two bull pens, another store and a sick bay were constructed.

247. In an effort to be self-sufficient in water supplies as far as possible, four wells were sunk from which water is pumped to supply paddocks and buildings.

248. Forty acres of fodder was established; fourteen acres of pasturage seeded with tropical kudzu was available for grazing and over thirty acres in fenced holding-paddocks provided.

249. The strength at the end of the year, not including growing stock from the St. Joseph Stock Farm, was as follows :—

<i>Bulls</i>	<i>Cows</i>	<i>Heifers</i>	<i>Heifer Calves</i>	<i>Bull Calves</i>	<i>Total</i>
2	33	32	2	7	76

250. Nine calves, seven bulls and two heifers were born. Milk production, which commenced during September, amounted to 2,353 gallons.

251. In addition to the cattle herd, a unit of Water Buffaloes was established, 2 bulls, 4 cows, 14 heifers.

Horsekind

252. The existing breeding policy was continued, namely the production of a general type of utility horse; the provision of selected jacks for mule and improved donkey breeding and the stationing of thoroughbred stallions as long as the existing animals are suitable for service.

253. The use of the light draft studs continues to be disappointing and the approach to the stimulation of the use of this class of sire is being made through actual breeding operations within the Department. In this connection, two selected Canadian mares were imported which have been served by the French Canadian light draft stallion. By this means, it is hoped to be able to exhibit suitable animals, the females for mule breeding and the males for draft and riding purposes, including police work.

254. The demand for jack services in connection with mule and donkey breeding continued to be satisfactory.

255. The thoroughbred breeding season was a relatively poor one as a total of only 19 mares was served. One stallion "Sunshaft" died and another, "Portora" was sold to the Antigua Turf Club.

256. The total strength of the Stock Farms at the end of the year is shown in Table 26.

Pigs

257. The pig units at both Farms were maintained as before.

258. In implementing a recommendation of the Local Food Production Committee, as well as improving the standard of pig at the two Farms, an importation of Large Blacks and Berkshires was made from the United Kingdom. These pigs, 48 gilts and 2 boars of the Large Black breed and 25 gilts and 2 boars of the Berkshire breed, were selected by Dr. T. A. des Iles, Veterinary Officer. Very efficient assistance was rendered by the Crown Agents in the handling of this purchase and an excellent quality of pigs was obtained. The pigs arrived in August.

259. Allocations of this breeding stock were made to the two Farms and to the several Breeding Units and District Stations, the two latter centres receiving in-pig gilts.

260. The breeding performance of the gilts has been very satisfactory. From the total of 73, one was slaughtered as the result of an accident, ten farrowed and the remainder were served and are known to be pregnant.

261. During the year, 318 piglets were farrowed, 215 Large Black and 103 Berkshire. From this total there was a loss of 34 piglets prior to weaning, 10 of which were crushed by their dams.

262. The total strength of the two Farms at the end of the year is shown in Table 27.

Goats

263. There was no change in the breeding policy. At the St. Joseph Stock Farm, a change in management was made whereby the former practice of hand-rearing of kids and recording of milk production was resumed. This also necessitated the provision of additional runs to accommodate the does in milk.

264. An importation was made from the United Kingdom of 2 British Alpine Bucklings, 2 British Alpine Goatlings, 2 Anglo-Nubian Bucklings and 2 Anglo-Nubian Goatlings.

265. Rather heavy losses were encountered by deaths, which were associated with parasitism and unfavourable weather conditions, of young stock at the Tobago Farm.

266. Changes have been made in the housing of the flock so as to provide more satisfactory conditions.

267. The total strength at the two Farms at the end of the year is shown in Table 28.

Sheep

268. Sheep breeding is confined to the Tobago Stock Farm and the breeding policy is directed towards the gradual establishment of a flock graded to the Barbados Black Belly breed.

269. Losses were encountered in the lamb crop, principally during the rainy season, associated with parasitism. Changes are being made in the housing of the ewes with lambs at foot.

270. The strength at the end of the year was 181 head, composed of 10 rams, 134 ewes, 17 ram lambs, 14 ewe lambs and 6 wethers.

Poultry

271. There was no change either in the two breeds maintained or the breeding policy.

272. The general health of the stock was satisfactory. There were no reactors to the annual Tuberculin test.

273. Egg production was satisfactorily maintained during the first half of the year but there was a marked drop during the moulting period, probably aggravated by an unavoidable change of feed at that time. The production was higher in the White Leghorn than in the Rhode Island Red units.

274. There was a marked improvement in the percentage of hatchability of eggs incubated as compared to the previous year, the overall figure reaching 66 per cent. in 1953.

275. In continuation of the policy of exchanging pure-bred for scrub cockerels of both breeds, the numbers exchanged amounted to 149 Rhode Island Red and 69 White Leghorn.

276. Importations comprised 120 Pedigreed Rhode Island Red chicks and 30 White Leghorn from approved hatcheries in Canada. These were required for replacements of breeding stock.

277. Small units of Muscovy ducks were maintained at both Farms and it is gratifying to record that the demand for ducks for rearing purposes is on the increase. A total of 71 drakes, ducks and ducklings were sold.

278. The total poultry strength at the end of the year is shown in Table 29.

Rabbits

279. A small unit of Flemish Giants is maintained at each Farm to provide animals for sale and experimental purposes. In view of the encouraging demand for breeding stock, arrangements are being made to provide additional and improved housing facilities to rear these animals on a bigger scale.

Pastures, Fences, Crops, Buildings, &c.

280. Continued emphasis is being placed and advocated on the maximum use of good quality grass and fodder crops as the cheapest and most efficient feeds for milk and meat production. At the St. Joseph Stock Farm, in particular, it has been possible, by improved management over the last four-year period, to carry out this practice while maintaining the productivity of pastures and fields. In addition to the already established grasses, increased plantings of Tropical Kudzu (*Pueraria phaseoloides*) and initial trials with Kale (Thousand Head) were made. In addition, a small experiment was laid down on one of the Savannah Grass (*Axonopus compressus*) pastures to determine the response to fertilizer applications by this particular species. The results of this experiment will be reported on completion of the trial.

281. At the Tobago Farm, field cultivation was extended to include approximately 23 acres of fodder crops and pasture grasses.

282. Plantings of corn, as customary, were carried out at both Farms. The yield at the St. Joseph Farm was affected by damage to the growing crop by heavy winds and rain during the month of August. A total yield of 82,283 lb. of dried shelled corn was obtained from approximately 50 acres.

283. General maintenance of fences was carried out, while several new pastures and fields at the Tobago Farm were fenced.

284. At the St. Joseph Farm, work was commenced on the construction of the new building to house the new milk processing plant.

285. At the Tobago Farm, twelve additional stanchions were installed which now allowed standing for twenty-four animals. In addition, two new manure bins were provided and work carried out on the reconstruction of a lambing pen. The Trinidad Government Railway shed was made available and preliminary and temporary works were carried out to allow for the accommodation of bulls, calves and pigs. It is planned that permanent adaptation of this building should be carried out in 1954.

Revenue of the Stock Farms

286. The total revenue of the St. Joseph Stock Farm was \$122,762.36 and the Tobago Farm, \$22,884.30. Details are given in Table 30.

MARKETING DIVISION

Market Conditions and Supplies

287. Local markets were generally well supplied with ground provisions and vegetables throughout the year, importations from other West Indian islands assisting materially in keeping the market balanced. Following the phenomenal crop of 1952, a high production of corn was maintained until the close of the dry season. Pulses, especially pigeon peas and black-eye peas, were available in large quantities, but the quality of the dry pigeon peas was generally unsatisfactory. Citrus fruit supplies reached record levels.

Purchases of Local Produce

288. Substantially larger quantities of produce, other than corn, were purchased by the Marketing Board in 1953 than in the previous year. The winter corn harvest was significantly smaller but the market was kept evenly supplied from corn stored over from the 1952 season. Comparative figures are given below :

	1952	1953
	<i>Short Tons</i>	<i>Short Tons</i>
Corn	1,976	877
Produce other than corn ...	615	998
	2,591	1,875

Importations

289. Imports of sweet potatoes from other West Indian colonies continued to increase, the quantity imported in 1953 being approximately double that of 1951. Imports of other commodities fell off. Importations of vegetables and fruit from the Caribbean area are shown in Table 31.

Shipments from Tobago to Trinidad

290. Shipments of produce from Tobago, except for corn, improved markedly. Shipments of plantains, which declined to a low level in 1952, increased more than three-fold. (See Table 32).

Ground Provisions Depot

291. This retail section continued to function satisfactorily and increased its purchases from \$116,878 in 1952 to \$127,254 and its sales from \$149,541 to \$160,573.

Seeds and Planting Materials

292. Sales of imported seeds showed a slight decrease while sales of local plant material were restricted by cessation of dealings in banana plants. Comparative figures for 1951-1953 are :

	1951	1952	1953
Imported seeds ...	\$18,383	\$20,770	\$19,159
Local plants ...	2,805	11,207	1,578

Fertilizers and Insecticides

293. As the service provided became better known the sale of fertilizers showed a considerable increase.

Sales of Fertilizers and Insecticides

		1951	1952	1953
Fertilizers	...	36 Short tons	43 Short tons	148 Short tons
Insecticides	...	\$844	\$1,979	\$1,790

Rice Husks

294. The volume of purchases increased from 244 tons in 1952 to 455 tons in 1953 and from this were extracted 132 tons rice bran and 22 tons broken rice which were incorporated in feeding mixtures.

Fish

295. There was a further drop in fish purchases. Consignments from the Matelot Fishermen's Co-operative amounted to approximately 14 tons, on which an average price of 18 cents per pound was realised for all classes of fish. The other co-operatives again failed to operate.

Molasses

296. The requirements of the Marketing Board were fully met. Sales of molasses amounted to 19,691 gallons and 14,788½ gallons were used in the preparation of feeds.

Livestock Feeds

297. Sales of feeds increased from 1,727 short tons in 1952 to 2,046. This increase was spread over all feeds, with the exception of dairy ration which fell by 119 tons.

		1952	1953
		Short tons	Short tons
Dairy Ration	...	539	420
Poultry Mash	...	512	800
Scratch Grain	...	275	338
Pig Ration	...	401	488
		1,727	2,046

In addition, 623 tons of feed ingredients were disposed of to Government Institutions and stock owners.

Improvement to Building at St. Joseph

298. In the latter part of the year, reconstruction work was commenced on the enlargement of the building and erection of a new drier for grains. An elevator and conveyor system was installed to facilitate the storage of grain in the steel silos.

Distribution of Banana Plants for the Cocoa Board

299. The Division undertook the distribution of 15,000 imported Lacatan banana plants on behalf of the Cocoa Board.

Depot Extensions

300. A new site was selected for the Depot at Toco and construction was started towards the end of the year. The mobile unit system was extended to Tunapuna, Tacarigua and Arouca to serve producers in those districts.

FISHERIES DIVISION

301. During the year a Fishery Officer and a Fish Culturist were appointed. In addition, Dr. E. J. Reijntjes, an authority on fishery matters with long experience in the East Indies and Surinam, was engaged for three months to survey the Trinidad fisheries and make recommendations. Then, towards the end of the year, Dr. C. F. Hickling, the Fishery Adviser to the Secretary of State, spent a month in Trinidad in order to observe progress and make recommendations for further activity. The year was, therefore, devoted more to taking stock of the position and formulating policy than to active development.

Improvements

302. The work at Carenage, reported last year, was completed early in 1953. The rest of the funds available were spent in Toco, where the Fish Landing was levelled and improved so as to accommodate more boats, and a building was erected containing an iceroom, a rest room, two cooking bays, a shower, a toilet and facilities for washing fish.

303. Preliminary estimates were obtained for possible improvement work at Port-of-Spain and at Orange Valley.

Investigations

304. The Lobster Survey at Buccoo Reef, Tobago, continued until bad weather set in in the Autumn. Results remain to be worked out.

Statistical Data

305 As in previous years, the only records available at the time of writing, apart from Marketing Board figures reported elsewhere, are of the fish handled in the Port-of-Spain and San Fernando Municipal Markets. The 1953 figures were:—

Port-of-Spain	...	...	...	3,636,922 lb.
San Fernando	...	...	...	1,191,556 ,,
				4,828,478 lb.

Trawl Fishing

306. The 70-ft. Trawler "Suffolks Rose" fished throughout the year off the North Coast. Results are understood to have been moderately successful, but considerable time was lost through mechanical and other troubles.

307. Two Port-of-Spain pirogues have pioneered inshore shrimp trawling with very satisfactory results. Their owners plan to extend operations and to employ larger craft.

308. The Fisheries Division has as yet no vessel of its own.

Pond Culture of Fish

309. The experimental station at Bamboo Grove was developed. By the end of the year there were seven ponds of from 0.25 to 1.66 acres, three lesser ones and four small breeding ponds. A laboratory and a house for the caretaker were completed.

310. The initial experiments started last year produced large quantities of stunted fish, owing to an uncontrolled increase in numbers due to early and rapid breeding. Research is now directed towards increasing the size of the fish by controlling their numbers and selecting quick-growing strains, as well as towards increasing the productivity of the ponds by the use of lime and fertilisers. The combined advice of Dr. Hickling and Dr. Reijntjes has provided a very useful fund of knowledge.

311. In September, the St. Joseph River rose, following heavy rain, and flooded the site. Fish were able to swim from pond to pond, so all the experiments then in progress were vitiated. Risk of further floods, pending a decision to flood-proof the site, severely limited activity for the remainder of the year.

LAND SETTLEMENT

Development of New Areas

312. The development of 5 of the 8 Land Settlements financed by Colonial Development and Welfare Funds under the present Five-Year Programme, continued. Work consisted mainly of Road Construction, the erection of Farm Buildings, installation of two pipe-borne water services and, initial preparation of one Central Farm. Preparations were also made for the planting of tree crops on two locations. Survey work was undertaken and continues on most of the locations and it is anticipated that settlers will be put into occupation of some of the lands in 1954. The shortage of trained agricultural and survey staff has retarded progress.

Maintenance of Established Settlements

Tenancies

313. On Settlements already established, 7 new tenancies were created. On 79 holdings tenancies were terminated and the holdings were then re-tenanted.

Agricultural Development

314. On the whole, the agricultural development on holdings during 1953 has been satisfactory. On areas where perennial crops are cultivated, much more interest has been shown and more intensive cultural work carried out. This has been mainly due to attractive markets for the crops produced. There have, however, been one or two cases of slackening of interest in agricultural development. Two areas on which this has occurred are at Brooklyn and La Pastora. These are situated near to towns and the settlers' houses are owned by Government.

Housing

315. Generally, there has been much greater interest in the building of houses by settlers, and a better type of architecture is being employed, notably by East Indian Settlers.

316. It is significant that, in the majority of cases, wherever the settler has provided himself with a good house the agricultural development of his land is satisfactory; whereas, where settlers live in houses owned by Government, the agricultural development is neither so great nor so uniform.

Social and Co-operative Activities

317. A much greater response is being obtained from settlers in the formation of organizations amongst themselves, such as Settlers Associations, Recreation Clubs, &c. In a few cases, these Settlers Associations discuss the general conditions prevailing on their respective locations with a view to making recommendations for improvements. Guidance and assistance in this is being given by the Staff.

318. A number of new Co-operatives, Agricultural Credit Societies, Credit Unions, &c., have also been formed by and amongst settlers.

Revenue

319. Revenue from Settlements consists mainly of Rent Payments and the Sale of Produce from Reserves. Under this latter head, approximately \$14,500 was collected in 1953.

CONFERENCES

Mr. C. H. B. Williams, Director of Agriculture, attended the International Genetics Conference held at Bellagio, Italy, in August; the Conference of Directors of Agriculture held at Wye College from the 7th to 11th September; and the 1953 Cocoa, Chocolate and Confectionary Alliance, Ltd., from 15th to 17th September.

Dr. L. R. Hutson, Deputy Director of Agriculture (Animal Husbandry) attended the 1953 Convention of the American Veterinary Medical Association held in Toronto from the 20th to 23rd July. From the 9th to 15th August, he attended the 15th International Veterinary Conference in Stockholm, Sweden.

Together with Mr. V. O. Ferrer, Marketing Officer, who was at the time acting Deputy Director (Crop Husbandry) he attended the 2nd Meeting of the British Caribbean Advisory Council on Agriculture, Animal Health and Husbandry, Forestry and Fisheries, which commenced on the 3rd December in Barbados. He was also in attendance at a meeting of the Veterinary Committee which immediately preceded the meeting of the Council.

PUBLICATIONS

Flora of Trinidad and Tobago, Vol. II, Part IV. Polemoniales (pars) Baraginaceae, Convolvulaceae, Solanaceae. Price \$1.20 (B.W.I.)

Bulletin No. 5 (New Series)—Regulations concerning the importation of plants and plant products, &c. Restrictions on the importation of plants, plant products, soil and dung, imposed by regulations under the Plant Protection Ordinance, 1940.

Bulletin No. 6 (New Series)—Observations on simultaneous vaccination in the control of fowl pox and Newcastle diseases, by L. R. Hutson, B.V.Sc., D.V.Sc.

Progress in dairying at St. Joseph Stock Farm, 1949-52, by L. R. Hutson, B.V.Sc., D.V.Sc.

The following appeared in the Supplement to *The Journal of the Agricultural Society of Trinidad and Tobago*:—

A quick look at Trinidad's Citrus Industry, by Egbert A. Tai, M.S.C., D.I.T.C.A. (Vol. LIII, Part 3, Sept., 1953, pp. 363-373).

The following appeared in the Supplement to *The Journal of the Agricultural Society of Trinidad and Tobago*:—

Part-time farming, by H. H. Beach, D.I.T.C.A. (Vol. LIII, Part 2, June, 1953, pp. 169-172.)

The following appeared in *Tropical Agriculture*:—

Red Ring disease of Coconuts in Trinidad and Tobago, by E. B. Martyn, B.A., A.I.C.T.A. (Vol. XXX, Nos. 1-3, January-March, 1953, pp. 43-53.)

LEGISLATION

	Date	References	Remarks
Government Notice No. 23. Cocoa Rehabilitation Scheme	20th January, 1953	... AGRICULTURAL. Council Paper No. 61 of 1940	... Additional variations to the Scheme.
Government Notice No. 28. Sugar Quotas Order, 1953	27th January, 1953	... Sugar Quotas Ordinance, Ch. 23. No. 13	Quotas for each sugar manufacturer for period 1st February, 1953 to 31st January, 1954 set out.
Government Notice No. 42. Plant Protection Regulations, 1953	10th February, 1953	... Plant Protection Ordinance, 1940	... Revocation of the Plant Protection Regulations, 1941, and enforcing of new regulations.
Government Notice No. 136. Wages Regulation (Sugar Industry) Order, 1953	27th July, 1953	... Wages Councils Ordinance, Ch. 22. No. 16	Statutory minimum remuneration payable to workers in the sugar industry fixed.
Government Notice No. 152. Production of Cane (Requisition of Returns) Order, 1953	5th September, 1953	... Production of Cane Ordinance, Ch. 23. No. 12	Requisition of returns to be submitted on prescribed form to the Director of Agriculture not later than 31st October, 1953.
Government Notice No. 179. Cocoa Rehabilitation Scheme	13th October, 1953	... Council Paper No. 61 of 1940	... Additional variations to the Scheme submitted in Council Paper No. 61 of 1940.
Government Notice No. 194. Price of Farmers' Canes, 1953	1st December, 1953	... Production of Cane Ordinance, Ch. 23. No. 12	Formula for determining the price of Farmers' Canes.
Gazette Notice No. 14. Licensing of Manufacturers of Copra Products	24th December, 1952	... Copra, Copra Products and Laundry Soap Control Regulations, 1943	Notice of the termination of Annual licences on 31st December, 1952.
Gazette Notice No. 24. Issue of Fire Licences	5th January, 1953	... Agricultural Fires Ordinance Ch. 23. No. 7	List of all those to whom authority to issue fire licences has been given.
Gazette Notice No. 52. Purchase and Sale of Copra	30th December, 1952	... Copra Control Order	Dealers asked to submit applications to buy or sell copra.
Gazette Notice No. 49. Appointment of Valuers	6th January, 1953	... Sugar Cane Small Holdings Ordinance, Ch. 23. No. 11.	Appointment of valuers under the provisions of Sugar Cane Small Holdings Ordinance.
Gazette Notice No. 72. Appointments to Cocoa Board	12th January, 1953	... Cocoa Industry Ordinance, Ch. 23. No. 22	Persons to be members of the Cocoa Board from 1st January, 1953 appointed.
Gazette Notice No. 158. Interim Price for Farmers' Canes, 1953	24th January, 1953	... Production of Cane Ordinance Ch. 23. No. 12	Price fixed at \$8.00 per ton.
Gazette Notice No. 869. Standing Rice Committee	26th May, 1953	... — — —	Appointment of a member to the Standing Rice Committee.
Gazette Notice No. 1015. Sugar Industry Labour Welfare Fund	23rd June, 1953	... Sugar Industry (Labour Welfare) Committee Regulations, 1949	Appointment of a member.
Gazette Notice No. 1204. Cane Farming Arbitration Board	21st July, 1953	... Production of Cane Ordinance, Ch. 23. No. 12	Appointment of Chairman of Cane Farming Arbitration Board.

	Date	References	Remarks
Gazette Notice No. 1249. Agricultural Statistics Committee	24th July, 1953	AGRICULTURAL—Continued	Appointment of Agricultural Statistics Committee.
Gazette Notice No. 1290. Standing Rice Committee	4th August, 1953		Appointment of Standing Rice Committee.
Gazette Notice No. 1396. Agricultural Statistics Committee	24th August, 1953		Appointment of Mr. Crooks to Agricultural Statistics Committee.
Gazette Notice No. 1487. Sugar Industry Rehabilitation Fund Committee	4th September, 1953		Appointment of Mr. R. Spink to Committee.
Gazette Notice No. 1488. Sugar Industry Rehabilitation Fund Committee	4th September, 1953	do.	Appointment of Mr. D. Hutchinson to Committee.
Gazette Notice No. 1550. Fire Licences	9th July, 1953	do.	...
Gazette Notice No. 1575. Wages Council for the Sugar Industry	23rd September, 1953	Agricultural Fires Ordinance, Ch. 23. No. 7	Amendment to list of persons authorised to issue fire licences.
Gazette Notice No. 1660. Sugar Industry (Labour Welfare) Committee	9th October, 1953	Wages Council Ordinance, 1949, Ch. 22. No. 16	List of members.
Gazette Notice No. 1716. Standing Rice Committee	14th October, 1953	Sugar Industry (Labour Welfare) Committee Regulations, 1949	Appointment of a member to the Sugar Industry Committee.
Gazette Notice No. 1781. Cocoa Board	28th October, 1953	—	Appointment of Mr. C. Mentor as a member.
Gazette Notice No. 1834. Sugar Industry Rehabilitation Fund Committee	4th November, 1953	Cocoa Industry Ordinance, Ch. 23. No. 16	Appointment of Mr. Murray to Cocoa Board.
Gazette Notice No. 1903. Marketing Board	14th November, 1953	Sugar Industry (Special Funds) Ordinance, No. 12 of 1948	Resumption of duty of member.
Gazette Notice No. 1904. Sugar Industry Rehabilitation and Price Stabilization Fund Committee	14th November, 1953	Marketing Board Ordinance, Ch. 23. No. 8	Appointment of a member.
Gazette Notice No. 1997. Fire Licences	27th November, 1953	Sugar Industry (Special Funds) Ordinance No. 12 of 1948	Appointment of a member.
Gazette Notice No. 2112. Fire Licences	15th December, 1953	Agricultural Fires Ordinance, Ch. 23. No. 7	Removal of name from list of authorised persons.
Council Paper No. 16 of 1953	8th May, 1953	do.	Authority given to issue Fire Licences in Tacaribe and Cachipa Districts.
		—	2nd Interim Report of the Local Food Production Committee.

LEGISLATION—CONTINUED

	Date	References	Remarks
Government Notice No. 3. Importation of Animals (Foot-and-Mouth Disease) (Alberta, Saskatchewan and Manitoba) (Revocation) Regulations, 1952	30th December, 1952	VETERINARY Diseases of Animals Ordinance, Ch. 25. No. 2	Importation of Animals (Foot-and-Mouth Disease) (Alberta, Saskatchewan and Manitoba, Canada) Regulations, 1952.
Government Notice No. 5. Swine Fever Order	5th January, 1953	do.	... Area in Moruga declared an infected area.
Government Notice No. 12. Importation of Animals (Diseases of Animals) Regulations, 1953	13th December, 1953	do.	... Vessels arriving in the Colony from specified places to be examined by an officer of the Department of Agriculture.
Government Notice No. 41. (Proclamation No. 4). Swine Products Proclamation	13th February, 1953	Customs Ordinance, Ch. 32. No. 2	... Proclamation prohibiting the carriage coastwise from Trinidad to Tobago of swine and swine products.
Government Notice No. 43. Importation of Animals (Dogs and Feline Animals) Regulations, 1953	10th February, 1953	Diseases of Animals Ordinance, Ch. 25. No. 2	Regulations restricting the importation of dogs or feline animals into the Colony, except under certain conditions.
Government Notice No. 69. Prohibition of Importation of Horses, Mules and Asses from British Guiana, 1953	17th March, 1953	do.	... Prohibition of importation of horses, mules and asses from British Guiana due to Equine Encephalomyelitis.
Government Notice No. 60. Diseases of Animals, Infected Areas Order	16th April, 1953	do.	... Cessation of district in the Ward of Moruga to be an infected area.

LEGISLATION—CONTINUED

	Date	References	Remarks
Government Notice No. 82. Slaughtering of Livestock (Amendment) Order, 1953	23rd April, 1953	VETERINARY— <i>Continued</i> ... Slaughtering of Livestock Order, 1952 ...	Paragraph 6 (1) of the Slaughtering of Livestock Order, 1952, revoked and replaced.
Government Notice No. 129. Importation of Animals (Diseases of Animals) (Revocation) Regulations, 1953	7th July, 1953	... Diseases of Animals Ordinance, 1952 ...	Revocation of the Importation of Animals (Diseases of Animals) Regulations, 1953.
Government Notice No. 146. Diseases of Animals (Poultry) (Amendment) Regulations, 1953	18th August, 1953	... Diseases of Animals (Poultry) Ordinance, 1952 ...	Amendment to the First Schedule of the Diseases of Animals (Poultry) Regulations, 1952.
Gazette Notice No. 254. Veterinary Surgeons Register, 1953	12th February, 1953	... Veterinary Surgeons (Registration) Ordinance, Ch. 25. No. 1	List of Veterinary Surgeons.
Gazette Notice No. 465. Slaughter-House Bye-Laws, Couva	27th February, 1953	— — —	Slaughter-House Bye-Laws, Couva, approved.
Gazette Notice No. 1218. Veterinary Surgeon, Registration	6th July, 1953	... Veterinary Surgeons (Registration) Ordinance, Ch. 25. No. 1	Registration of Dr. W. P. Unsworth.
Gazette Notice No. 1365. Pounds Authorisation	13th August, 1953	... Pounds Ordinance, Ch. 25. No. 8	Authorisation to establish pounds in several districts in the Colony.
Gazette Notice No. 1530. Pounds Authorisation	8th September, 1953	do. do.	Authorisation to establish pound at Cedros Police Station.

TABLE I—CROWN LANDS RECOMMENDED FOR 25-YEAR LEASE OR PROBATIONARY AGREEMENT—JULY 1950-DECEMBER, 1953

					No.	Total Acreage		
						A.	R.	P.
<i>Recommended and executed</i>								
(a)	25-year leases	...	...	...	31	815	2	01
(b)	Probationary Agreements	...	...	...	177	1,633	3	05
<i>Recommended and awaiting execution</i>								
(a)	25-year leases	...	...	...	30	349	0	27
(b)	Probationary Agreements	...	...	...	91	772	3	06
TOTAL					329	3,571	0	39

TABLE II—GUARANTEED MINIMUM PRICES FOR LOCALLY-GROWN FOODS

	Price per lb.
Pigeon peas, dry shelled	12 Cents
Black-eye peas, dry shelled	12 "
Soya beans, dry shelled	12 "
Corn, dry shelled	5 "
Yams—Lisbon variety only	4 "
Sweet potatoes	3 "
Tannias	3½ "
Adlay, dry threshed grain	5 "
Eddoes	1 "
Sesame (or Bene)	12 "
Plantains—Fingers	4½ "
Do. —Stems	4 "
Bananas—Gros Michel and Suerier	1½ "
Do. —Governor	1 "

TABLE III—ANNUAL RAINFALL, TRINIDAD AND TOBAGO

Station	Total 1953, inches	22-Year Mean, inches
<i>North Trinidad :</i>		
River Estate, Diego Martin	87.18	74.99
St. Clair, Port-of-Spain	61.84	68.10
La Pastora, Santa Cruz	85.49	84.49
I.C.T.A., St. Augustine	68.52	68.07
Meteorological Station, Piarco	68.50	72.97
Frederick Estate, Caroni	62.60	85.23
Torrecilla Estate, Arima	94.30	—
Works and Hydraulics, Toco	75.49	71.22
Hollis Reservoir, Valencia	120.89	120.77
Sans Souci Estate, Sangre Grande	112.72	—

TABLE III—ANNUAL RAINFALL, TRINIDAD AND TOBAGO—*Contd.*

Station				Total 1953, inches	22-Year Mean, inches
<i>Central Trinidad :</i>					
Waterloo Estate, Waterloo ...	...	...	...	65.14	65.33
Todds Road Estate ...	...	...	...	74.50	77.63
Tamana Teak Plantation ...	...	...	...	116.22	113.92
McBean Estate, Couva ...	...	...	...	62.51	65.85
Forres Park Estate, Claxton Bay ...	...	...	...	66.37	60.62
New Lands Estate, Biche ...	...	...	...	119.53	100.55
Marper Farm, Manzanilla ...	...	...	...	108.99	105.51
Brasso Tamana ...	...	...	...	102.70	103.61
Cocal Estate, Nariva ...	...	...	...	98.85	—
<i>South Trinidad :</i>					
Brothers Estate, Williamsville ...	...	...	...	77.83	81.74
Usine Ste. Madeleine, San Fernando ...	...	...	...	68.80	69.41
Perseverance Estate, Cedros ...	...	...	...	56.70	58.69
Poole Syndicate, Rio Claro ...	...	...	...	101.51	109.61
Navet C.M. School, Rio Claro ...	...	...	...	84.01	—
Point Fortin Filtration Plant ...	...	...	...	81.19	81.77
T.L.L., Barrackpore, Penal ...	...	...	...	69.13	69.57
Mayaro Police Station, Mayaro ...	...	...	...	90.60	79.73
Moruga Police Station, Moruga ...	...	...	...	75.85	71.49
T.L.L., Guayaguayare ...	...	...	...	93.89	88.62
Siparia Old Road, Fyzabad ...	...	...	...	61.96	68.36
<i>Tobago :</i>					
Botanic Gardens ...	...	...	...	85.90	79.03
Government Farm ...	...	...	...	66.98	67.61
Friendship Estate ...	...	...	...	63.10	—
Hermitage Estate ...	...	...	...	95.67	95.86
Green Hill Estate ...	...	...	...	103.95	—
Kendal Estate ...	...	...	...	86.33	—

TABLE IV—MEAN MONTHLY RAINFALL, TRINIDAD AND TOBAGO

Month				1953, inches	22-Year Mean, inches
January ...	...	...	...	6.07	6.04
February ...	...	...	...	3.04	4.87
March ...	...	...	...	2.59	2.94
April ...	...	...	...	1.15	3.17
May ...	...	...	...	8.50	5.87
June ...	...	...	...	6.66	12.02
July ...	...	...	...	11.50	9.95
August ...	...	...	...	11.16	11.15
September ...	...	...	...	8.96	6.74
October ...	...	...	...	9.11	6.84
November ...	...	...	...	7.97	8.24
December ...	...	...	...	8.82	8.83
TOTAL ...	...	...	...	85.53	86.66

TABLE V—ANIMALS IMPORTED INTO TRINIDAD, 1953

Type			Source			No.	Total
			<i>Animals for Slaughter</i>				
SWINE	...	...	British West Indies	...	...	3	3
			<i>Animals for Breeding and Work</i>				
CATTLE	...	...	British West Indies	...	...	57	57
GOATS	...	...	British West Indies	...	...	3	10
			United Kingdom	...	...	7	
SHEEP	...	...	British West Indies	...	...	9	9
SWINE	...	...	United Kingdom	...	...	78	78
HORSES	...	...	United Kingdom	...	...	33	73
			Canada	...	...	18	
			British West Indies	...	...	22	
ASSES	...	...	British West Indies	...	...	9	9
MULES	...	...	United States of America	...	...	137	182
			British West Indies	...	...	36	
			Other sources	...	...	9	

TABLE VI—IMPORTATION OF FRESH, CHILLED OR FROZEN MEAT

Country	Cwt.	Cwt.
<i>Fresh, chilled or frozen beef or veal</i>		
Canada and Newfoundland	1,278.39	
Australia	12,097.44	
New Zealand	18,519.09	
Argentina	1,239.76	
Uruguay	218.74	
United Kingdom	1,343.91	
Netherlands	1.04	34,698.37
<i>Fresh, chilled or frozen mutton and lamb</i>		
Australia	366.33	
New Zealand	6,968.90	7,335.23
<i>Fresh, chilled or frozen pork</i>		
Australia	13.39	
New Zealand	3,585.86	
Argentina	44.64	
Netherlands	119.05	
Canada and Newfoundland	9.54	3,772.48

TABLE VII—AGRICULTURAL EXPORTS, TRINIDAD AND TOBAGO, 1953

				Quantity	Value	Value
					\$	\$
<i>Sugar and By-Products</i>						
Sugar (unrefined)	...	...tons	...	129,499	25,486,005	
Sugar (refined)	...	...lb.	...	415,349	41,045	
Molasses, inedible (raw)	...	...cwt.	...	613,698	536,102	26,063,152
<i>Cacao</i>						
Beans	...	...cwt.	...	192,933	11,720,925	
Butter	...	...lb.	...	6,926	8,178	
Powder	...	...	...	12	11	11,729,114
<i>Citrus</i>						
Lime juice (raw)	...	...liq. gal.	...	23,578	27,069	
Lime juice (concentrated)	...	...	...	38	221	
Limes, Fresh	...	...lb.	...	12,739	1,674	
Grapefruit, Fresh	...	...	...	14,005,894	860,457	
Oranges, tangerines and mandarines	...	...	...	4,819,825	323,609	
Canned grapefruit juice	...	...liq. gal.	...	1,366,687	1,404,087	
Canned orange juice	...	...	...	295,023	477,003	
Canned orange and grapefruit juice (mixed)	...	...	...	149,845	132,971	3,227,091
<i>Tonca Beans</i>						
Tonca Beans	...	...lb.	...	414,982	542,116	542,116
<i>Rubber</i>						
Rubber, raw	...	...lb.	...	110,528	52,910	42,910
<i>Coffee</i>						
Coffee, raw	...	...cwt.	...	21,199	1,800,523	1,800,523
<i>Coconuts and Derivatives</i>						
Coconut oil, unrefined	...	...lb.	...	471,055	115,145	
Coir fibre	...	...	...	250,700	17,654	
Copra	...	...	...	14,620	229,826	362,625
<i>Vegetables</i>						
Vegetables, Fresh and Dry	...	...lb.	...	458,325	98,506	
Beans and Peas, Lentils, &c.	...	...	...	116,270	15,402	113,908
<i>Fresh Fruit, Other sorts</i>						
Fresh Fruit, other sorts	...	...lb.	...	406,821	72,465	
Bananas	...	...	...	2,607,551	120,864	193,329
<i>Livestock and Hides</i>						
Live animals, chiefly for food	...	...	...		6,205	
Live animals, other than for food	...	...	...	939,533	148,767	
Hides	...	...lb.	...	91,280	14,593	169,565
<i>Honey</i>						
Natural Honey	...	...lb.	...	47,233	8,796	8,796
<i>Milk</i>						
Milk and Cream, fresh	...	...lb.	...	52,498	8,761	8,761
<i>Spices</i>						
Nutmeg	...	...lb.	...	56,510	20,017	
Mace	...	...	...	701	369	
Other spices	...	...	...	6,749	7,052	27,438
TOTAL VALUE						\$44,289,328

TABLE VIII—EXPORTS OF MANUFACTURED AGRICULTURAL PRODUCTS,
TRINIDAD AND TOBAGO, 1953

Item	Quantity	Value	Value
<i>Sugar and By-Products</i>		\$	\$
Rump. gal. ...	264,197	1,104,343	
Syrup and Molasses (edible) ...lb. ...	921,547	7,281	1,111,624
<i>Citrus</i>			
Lime oil (distilled)lb. ...	21,930	223,225	223,225
<i>Coffee</i>			
Coffee (prepared)lb. ...	33,652	39,986	39,986
<i>Cocoanuts and Derivatives</i>			
Coconut oil (refined)lb. ...	1,568,986	454,204	454,204
Margarinelb. ...	573,348	240,246	
Lard substitutelb. ...	233,491	91,461	
Other sorts of shortening and similar edible fatslb. ...	2,050	820	332,527
<i>Soap</i>			
Stock Soaplb. ...	45,000	8,550	
Hard Soaplb. ...	887,249	171,310	179,860
<i>Bitters</i>			
Bittersliq. gal. ...	62,239	681,238	681,238
<i>Jam, Marmalade and Fruit Jellies</i>			
Jam, Marmalade and Fruit Jellieslb. ...	14,611	4,350	4,350
<i>Wine</i>			
In bottleliq. gal. ...	5,997	12,616	
In woodliq. gal. ...	4,665	6,510	19,126
TOTAL VALUE			\$3,046,140

TABLE IX—TRINIDAD CROP STATISTICS—SUGAR

	1953	1952
Estates' canes ground, tons	1,047,945 (69.91%)	966,363 (73.13%)
Farmers' canes ground, tons	451,036 (30.09%)	355,081 (26.87%)
Total canes ground, tons	1,498,981	1,321,444
Sugar output, tons	152,618	137,358
Cane per ton sugar, tons	9.82	9.62
Estates' area reaped, acres	35,191	34,657
Average estate yield per acre, tons	29.78	27.88
Estimated standover canes:		
Estates, tons	744	—
Farmers, tons	—	200
Price Farmers' canes per ton	\$11.36	\$10.86

TABLE X—EXPORTS AND VALUE OF RAW CACAO, TRINIDAD AND TOBAGO

Year	Exports	Value
	lb.	\$
1949	12,831,728	4,519,207
1950	16,197,928	8,360,678
1951	19,316,640	11,563,270
1952	14,087,360	8,237,141
1953	21,608,496	11,720,925

TABLE XI—DISPOSAL OF LIVESTOCK AND CROPS FROM DEMONSTRATION STATIONS

	Consumption	Planting or Breeding
<i>Livestock :</i>		
<i>Cattle</i>		
Cows	1	—
Steers	4	—
Bull calves	8	—
Milk	21,748 lb.	—
<i>Pigs</i>		
Sows	7	—
Piglets	9	196
Pork	651 lb.	—
<i>Goats</i>		
Bucks	1	—
Kids	5	3
<i>Rabbits</i>		
Does	1	47
Bucks	6	43
Bunnies	1	20
<i>Poultry</i>		
Cocks	21	—
Hens	10	—
Chicks	12	301
Eggs	12,483	3,979
Exchange (cockerels)	—	153
<i>Crops :</i>		
Coconuts	22,428	131
Cacao	23,396 lb.	—
Coffee	480 lb.	—
Limes	58 lb.	—
Grapefruit	42,064	—
Oranges	18,627	—
Bananas	15,480 lb.	—
Plantains	2,210 lb.	—
Maize	7,395 lb.	335 lb.
Rice	5,921 lb.	12,910 lb.
Yams	19,750 lb.	402 lb.
Tannias	169 lb.	500 lb.
Dasheen	1,144 lb.	—
Eddoes	236 lb.	—
Cassava	16,321 lb.	—
Melons	18,365 lb.	—
Sweet Potatoes	10,325 lb.	—
Pumpkins	1,099 lb.	—
Peas	1,608 lb.	17 lb.
Suckers (banana and plantain)	—	3,584
Vegetables (Mixed)	300 lb.	—
„ (Fresh)	4,431 lb.	—
Vegetable seedlings	—	11,998
„ boxes	—	186
Kudzu seeds	—	3 lb.
Cassava cuttings	—	1,700 bundles
Fodder grass cuttings	—	15,925
Gliricidia cuttings	—	1,776

TABLE XII—REVENUE FROM DISTRICT STATIONS, 1953

	El Reposo	Rio Claro	Penal	Louis d'Or	La Pastora	
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	
<i>Stock</i>						
Poultry ...	40 32	386 61	3 00	530 32	8 75	
Eggs ...	360 46	893 37	2 00	241 98	123 92	
Animals ...	1,358 60	1,531 00	970 93	2,080 20	340 00	
Milk ...	557 18	108 18	333 94	5 28	475 21	
<i>Crops</i>						
Cacao ...	3,560 82	1,416 24	—	4,433 41	—	
Coffee ...	300 99	3 60	—	—	—	
Rice ...	—	87 86	263 85	—	—	
Fruit ...	207 60	928 73	—	—	20 19	
Vegetables...	227 86	97 12	915 55	97 00	107 40	
Ground Provisions	775 25	1,256 34	—	145 89	42 18	
Miscellaneous	—	18 39	151 75	1,585 20	43 35	
Maize ...	141 72	181 27	29 89	56 38	31 17	
TOTAL	7,530 80	6,908 71	2,670 91	9,175 66	1,192 17	(\$27,478.25)

TABLE XIII—REVENUE FROM CENTRAL EXPERIMENT STATION, 1953

Item	Value
	\$ c.
Citrus	34,639 23
Sugarcane	21,557 58
Corn	5,887 19
Cacao	7,986 00*
Coffee	907 50*
Rice	405 68
Milk	433 96
Kudzu	157 75
Livestock	162 64
Yam	35 30
Miscellaneous	497 11
TOTAL	\$72,669 94

Note—*These figures do not include revenue from cacao and coffee, respectively, amounting to \$36,000.00. They are recorded by the Cocoa Board which now controls the commercial cacao and coffee on the Station.

TABLE XIV—CLONAL CACAO PLANT DISTRIBUTION TO COMMERCIAL GROWERS, 1953

County	METHOD OF PLANTING			Total
	Supplies	Complete Replanting	Partial Replanting	
Caroni	20,858	42,452	60,616	123,926
St. Andrew	5,791	43,764	46,716	96,271
St. George	11,043	28,488	31,301	70,832
St. David	1,708	290	18,922	20,920
Nariva-Mayaro	2,245	8,130	12,295	22,670
Victoria	1,805	8,455	3,500	13,760
St. Patrick	2,955	11,805	—	14,760
Tobago	5,487	32,083	—	37,570
TOTAL	51,892	175,467	173,350	400,709

TABLE XV—ACREAGE OF SUGARCANE VARIETIES PLANTED AT CENTRAL EXPERIMENT STATION

Variety				PERCENTAGE TOTAL ACRES REAPED			PERCENTAGE TOTAL ACRES PLANTED		
				1951	1952	1953	1951	1952	1953
B.37172	...	...	...	11.3	12.1		28.0	39.5	33.7
B.3337	...	...	...	36.9	38.3		31.1	26.8	27.3
B.37161	...	...	...	18.8	21.1		20.7	20.0	22.9
B.4362	...	...	...	—	0.1		1.8	1.8	7.3
B.34104	...	...	...	27.2	22.7		15.0	9.6	2.3
B.41227	...	...	...	0.5	0.8		—	0.5	2.2
B.4098	...	...	...	1.5	2.1		0.3	0.4	1.9
B.H. 10 (12)...	...	...	...	1.4	1.0		0.2	0.7	1.5
Others	...	...	...	2.4	1.8		2.9	0.7	0.9

TABLE XVI—RICE VARIETY TRIALS

				Mean Yield/plot		Mean Yield/acre	
<i>Trial 1 :</i>							
Bengarwar	...	...	...	23.65	± .788 lb.	2960	± 98.7 lb.
D. 52/37	...	...	...	22.3	± do.	2791	± do.
D. 85/42	...	...	...	22.25	± do.	2785	± do.
D. 54/42	...	...	...	18.85	± do.	2359	± do.
Sorro	...	...	...	18.5	± do.	2316	± do.
<i>Trial 2 :</i>							
Bolo	...	...	...	21.3	lb. ...	2975	lb.
Sughandi	...	...	...	19.3	„ ...	2696	„
Blue Bonnet	...	...	...	6.95	„ ...	971	„
Fortuna	...	...	...	6.85	„ ...	957	„
Rexoro	...	...	...	5.95	„ ...	831	„

TABLE XVII—BASIC DATA FOR SOIL CONSERVATION RUN-OFF PLOTS

	Length of Plot	Crop		Total rain	Total run-off	Per cent. soil less	
	ft.			cu. ft.	cu. ft.	Run-off	Tons/acre
Plot 1 ...	104	Bare fallow	...	8,814	1,873	21.3	150
Plot 2 ...	104	Strip cropped	...	8,814	394	4.5	0.8
Plot 3 ...	104	Sugarcane	...	8,814	133	1.5	0.3
Plot 4 ...	52	Bare fallow	...	4,407	743	16.9	127
Plot 5 ...	52	Elephant grass	...	4,407	96	2.2	0.8
Plot 6 ...	52	Corn and peas	...	4,407	65	1.5	0.7
Plot 7 ...	52	Tannia and cassava	...	4,407	274	6.2	7.1
Plot 8 ...	52	Bush fallow	...	4,407	88	2.0	0.2
Soil type: Las Lomas Sand		Slope: 21%		Total Rainfall: 84.7 inches			

TABLE XVIII—SUMMARY OF REPORTABLE LIVESTOCK DISEASES OCCURRING IN THE COLONY

Disease							
Anaplasmosis	...	...	...	...	...	...	1 case
Newcastle Disease	...	...	...	...	...	...	9 outbreaks
Piroplasmiasis	...	...	...	...	...	...	1 case
Pullorum Disease—Number of birds tested:	...	...	...	842	...	...	.24% reactors
Rabies Paralytic (Bat transmitted)	...	...	...	...	...	...	42 cases
Trichomoniasis	...	...	...	...	...	...	15 cases
Tuberculosis—							
Number of cattle tested:	...	...	...	3,386	...	...	1% reactors
Number of water buffaloes tested	...	...	...	581	...	...	14.5 %
Number of dairy goats tested	...	...	...	16	...	...	0.0 %
Number of pigs tested	...	...	...	13	...	...	0.0 %
Number of poultry tested	...	...	...	350	...	...	0.0 %

TABLE XIX—NUMBERS, CLASSES AND PERCENTAGES OF REACTORS TO TUBERCULIN TESTS

1951			1952			1953		
Class of Livestock	No.	% Re-actors	Class of Livestock	No.	% Re-actors	Class of Livestock	No.	% Re-actors
Cattle ...	3,887	1.4	Cattle ...	4,052	2.4	Cattle ...	3,386	1
Water Buffaloes...	1,167	28.0	Water Buffaloes	62	19.4	Water Buffaloes	581	14.5
Dairy Goats	112	0.9	Dairy Goats ...	27	12.2	Dairy Goats ...	16	0.0
			Pigs ...	25	4.0	Pigs ...	13	0.0
			Poultry ...	171	0.0	Poultry ...	350	0.0

TABLE XX—RESULTS OF PRELIMINARY SURVEY ON THE BLOOD CHEMISTRY OF CATTLE (MEAN HAEMAGLOBIN, CALCIUM, PHOSPHORUS AND MAGNESIUM VALUES)

Constituent	Group 1	Range	Group 2	Range	Group 3	Range	Group 4	Range
Haemoglobin (g%) ...	10.7	5.7-16.9	12.5	6.2-17.7	11.6	6.9-15.5	11.4	8.9-14.8
Calcium (mg %) ...	10.8	9.4-13.0	11.0	6.8-13.3	10.7	6.1-14.0	11.1	9.0-13.0
Phosphorous (mg%) ...	4.9	2.9-7.6	4.8	3.0- 9.3	4.7	3.0- 8.2	4.9	3.4- 6.8
Magnesium (mg%) ...	2.3	0.8- 4.4	2.7	1.1- 4.9	2.6	1.2- 5.3	2.9	2.1- 4.3

Note—Group 1—Very poor soils of northern detrital terraces, considered as acid sands, normally possessing a clay sub-soil. These are low in nitrogen, available phosphate and potash.

Group 2—Clay soils with a high pH and a calcareous sub-soil.

Group 3—Clay soils with a low pH, low in nitrogen and available phosphate, high in available potash.

Group 4—Moderately acid clay soils, low to medium in nitrogen, available phosphate potash.

TABLE XXI—SERVICES BY SELECTED SIRES, 1953.

Class of Sire	Trinidad	Tobago	Total
Stallions—Thoroughbred	10	9	19
Light Draft	3	1	4
Jacks to Mares	30	13	43
Jacks to Janets	186	19	205
Bulls	2,302	140	2,442
Boars	699	88	787
Bucks	1,269	259	1,528
Rams	—	67	67

TABLE XXII—SALES AT STOCK FARMS, 1953.

Class of Animal or Product	St. Joseph Stock Farm	Tobago Farm	Total
Cattle	47	30	77
Pigs	164	77	241
Goats	6	11	17
Sheep	—	48	48
Poultry	139	117	256
Eggs	16,361	12,210	28,571

TABLE XXIII—CATTLE STRENGTH: STOCK FARMS, 1953.

Breed and Sex	St. Joseph Stock Farm	Tobago Farm	Total
Pure-bred Holstein Bulls	4	—	4
Grade Holstein Bulls	42	4	46
Grade Holstein Cows	109	20	129
Grade Holstein Heifers	71	5	76
*Grade Holstein (Y.S.)	56	—	56
Water Buffalo Bulls	1	2	3
Working Oxen	4	2	6
Pure-bred Sahiwal Bulls	—	26	26
Pure-bred Sahiwal Cows	—	13	13
Pure-bred Sahiwal Heifers	—	23	23
Grade Sahiwal Bulls	—	4	4
Grade Sahiwal Cows	—	4	4
Grade Sahiwal Heifers	—	23	23
Pure-bred Zebu Bulls	4	—	4
Pure-bred Zebu Cows	4	—	4
Pure-bred Zebu Calves	3	—	3
Zebu Foundation Bulls	2	—	2
Zebu Foundation Cows	7	1	8
*Zebu Foundation (Y.S.)	11	—	11
	318	127	445

*Young Stock

TABLE XXIV—CALVES BORN AT STOCK FARMS, 1953.

Breed and Sex				St. Joseph Stock Farm	Tobago Farm	Total
Grade Holstein	Bulls	...	...	42	3	45
Grade Holstein	Heifers	...	...	44	3	47
Pure-bred Sahiwal	Bulls	...	...	—	5	5
Pure-bred Sahiwal	Heifers	...	...	—	9	9
Grade Sahiwal	Bulls	...	...	—	13	13
Grade Sahiwal	Heifers	...	...	—	9	9
Zebu	Bulls	...	...	5	—	5
Zebu	Heifers	...	...	7	—	7
				98	42	140

TABLE XXV—MILK YIELD: ST. JOSEPH STOCK FARM, 1949-1953.

Year				Average No. of cows milked daily	Total Annual Yield lb.	Daily Average yield per cow lb.
1949	...	...	...	74	453,236	17
1950	...	...	...	69	533,349	21
1951	...	...	...	60	553,364	25
1952	...	...	...	64	654,716	28
1953	...	...	...	66	574,333	24

TABLE XXVI—HORSEKIND: TOTAL STRENGTH ON STOCK FARMS, 1953.

Class of Animal					Number
Thoroughbred Stallions	...	...	...	...	1
Light draft	...	...	...	...	2
Mares	...	...	...	...	21
Colts	...	...	...	...	6
Fillies	...	...	...	...	4
Geldings	...	...	...	...	2
Mules	...	...	...	...	11
Mule Foals	...	...	...	...	6
Jack Donkeys	...	...	...	...	19
Janets	...	...	...	...	13
Total	...	...	...	...	85

TABLE XXVII—TOTAL PIG STRENGTH ON STOCK FARMS, 1953

Breed				Boars	Sows	Young Stock	Total
Large Black	...	...	...	16	48	101	165
Berkshire	...	...	...	17	25	22	64
Total	...	...	...	33	73	123	229

TABLE XXVIII—TOTAL GOAT STRENGTH ON STOCK FARMS, 1953.

Breed			Bucks	Does
Pure-bred British Alpine	...	...	27	24
Grade Alpine	...	...	8	9
Anglo-Nubian	...	...	10	10
Jumna-Pari	...	...	1	—
Foundation Stock	...	...	4	44
Total	...	...	50	87

TABLE XXIX—TOTAL POULTRY STRENGTH ON STOCK FARMS, 1953.

Breed			Cocks	Hens	Chicks
Rhode Island Red	...	...	39	239	285
White Leghorn	...	...	31	105	327
Total	...	...	70	344	612

TABLE XXX—REVENUE FROM STOCK FARMS, 1953.

Item			St. Joseph Stock Farm	Tobago Farm
Sale of Stock	...	...	\$13,893.98	\$7,291.99
Sale of Milk	...	...	104,828.06	11,953.90
Sale of Eggs	...	...	1,626.36	991.51
Service Fees	...	...	1,205.75	556.99
Stabling	...	...	—	114.00
Pasturage Fees	...	...	—	173.52
Sale of Coconuts and Limes	...	...	—	1,809.79
Miscellaneous	...	...	1,208.21	10.60
Total	...	...	\$122,762.36	\$22,884.30

TABLE XXXI—VEGETABLE AND FRUIT IMPORTATIONS FROM THE CARIBBEAN

			1951 Short tons	1952 Short tons	1953 Short tons
Sweet Potatoes	...	...	1,206	1,178	2,425
Yams	...	...	7	20	—
Other Vegetables	...	...	5	731	118
Plantains	...	...	104	266	134
Tomatoes	...	...	Not recorded	—	33
Fruit	...	...	do.	—	872
			1,322	2,735	3,582

TABLE XXXII—SHIPMENTS OF FOODCROPS FROM TOBAGO TO TRINIDAD

			1951 Short tons	1952 Short tons	1953 Short tons
Bananas	...	...	86	32	55
Plantains	...	...	65	11	38
Ground Provisions	...	...	939	363	862
Corn	...	...	51	145	119
Peas	...	...	5	1	10
			1,146	552	1,084

WEIGHTS AND MEASURES

4 drams	=	1 ounce (oz.)
16 ounces	=	1 pound (lb.)
28 pounds	=	1 quarter (qr.)
4 quarters	=	1 cwt. (112 lb.)
20 cwts.	=	1 ton (2,240 lb.)

2 pints	=	1 quart
4 quarts	=	1 gallon (Imperial)

(1) *Cacao* :

1 fanega	=	110 lb.
1 bag	=	200 lb. (dry cocoa)

(2) *Rice* :

1 barrel paddy = 160 lb.
 (as milled locally at present, without
 parboiling, provides approximately 80 lb.
 clean rice).

(3) *Citrus* :

Average Weight—Standard Field Crate	—Grapefruit 80 lb.
	Oranges 100 „
Average Fruit— Standard Field Crate	—Grapefruit 80 lb.
	Oranges 200 „
Average Weight—Shipping Crate	—Grapefruit 80 lb.
	Oranges 90 „
Average Fruit—Shipping Crate	—Grapefruit 80 lb.
	Oranges 200 „
Weight Canned Juice—Case of 24 × 20 oz. cans	38 „, gross
Weight of Fruit—Per Case of fruit	—Grapefruit 72 lb.
	Oranges 80 „
Average Weight of Standard Field Crate	— 80 „

(4) *Limes* :

1 barrel	=	160 lb.
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